Humboldt-Universität zu Berlin – Geographisches Institut

The “on-paper” hydropower boom

Learning from unsuccessful sustainable development projects in Bosnia and Herzegovina

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von
Özge Can Dogmus, M.Sc.

Präsidentin der Humboldt-Universität zu Berlin
Prof. Dr.-Ing. Dr. Sabine Kunst

Dekan der Mathematisch-Naturwissenschaftlichen Fakultät
Prof. Dr. Elmar Kulke

Gutachter/innen:

Prof. Dr. Tobias Krüger
Prof. Dr. James Linton
Prof. Jessica Budds

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Abstract

The global hydropower boom is a well-known phenomenon. It is either considered for its benefits to sustainable development or cautioned against its negative socio-environmental impacts. Yet the number of existing hydropower projects is not very high globally. This thesis thus aspires to develop a better understanding of the global hydropower boom and why this boom has not resulted in large-scale hydropower plant construction. The hydropower boom in Bosnia and Herzegovina was selected as the object of study. There, the number of constructed hydropower projects is negligible in comparison to the number of planned projects. Qualitative research methods were used to explore the case in depth. The data was collected between July and October, 2016 and between July and August, 2017.

Three main conclusions were drawn from the fieldwork conducted. Chapter II shows and explains why the hydropower boom is unlikely to take place in Bosnia and Herzegovina to the extent foreseen. It also questions the phenomenon at a global scale. Chapter III shows how small-scale hydropower projects are used by various actors for personal benefit. Corruption is rife in the sector and closely connected to the sustainable development discourse in the country. A key finding here is that small-scale hydropower projects create a safe space for corrupt actors. Chapter IV explores how the inhabitants of a small village in Bosnia and Herzegovina changed their sustainability imaginaries around hydropower. They did this in accordance with changing socio-economic conditions. This chapter thus illustrates how the flexibility of the term sustainability can be beneficial to marginalised local inhabitants. In general, this thesis, therefore, contributes to the hydropower literature. It shows that the hydropower boom is largely 'on-paper' but with real material consequences for sustainable development strategies, corruption, and local lives.

Zusammenfassung

Der weltweite Wasserkraftboom wird entweder mit seinen Vorteilen (Hochwasserschutz, Wirtschaftswachstum, erneuerbare Energieerzeugung) oder negativen Auswirkungen betrachtet (Zerstörung intakter Lebensräume, Verdrängung der Bevölkerung und Bedrohung von Existenzgrundlagen). Die vorliegende Arbeit versucht den Wasserkraftboom besser zu verstehen wie auch den Fakt, dass dieser bislang nicht zum Bau großer Wasserkraftwerke geführt hat. Eine Fallstudie wurde von Juli bis Oktober 2016 und Juli bis August 2017 in Bosnien und Herzegowina durchgeführt.

Auch dort ist die Zahl der gebauten Wasserkraftprojekte im Vergleich zur Zahl der geplanten Projekte vernachlässigbar gering. Qualitative Forschungsmethoden wurden angewendet und drei wesentliche Schlussfolgerungen gezogen. Erstens (Kap. II) wird erläutert, warum der Boom in Bosnien und Herzegowina nicht in dem vorgesehenen Ausmaß stattfinden wird und inwieweit das Phänomen einer Übertragung auf globalen Maßstab standhält. Zweitens (Kap. III) wird deutlich, wie v.a. kleinere Wasserkraftprojekte von Akteuren zum persönlichen Vorteil genutzt werden. Korruption ist in diesem Sektor weit verbreitet und eng mit dem Diskurs über nachhaltige Entwicklung im Land verbunden. Die kleinen Wasserkraftprojekte schaffen einen sicheren Raum für korrupte Akteure. Schließlich (Kap. IV) wurde untersucht, wie die BewohnerInnen eines kleinen Dorfes in Bosnien und Herzegowina ihre Vorstellungen von Nachhaltigkeit rund um die Wasserkraft verändert haben. Dies taten sie in Übereinstimmung mit sich ändernden sozioökonomischen Bedingungen. Dieses Kapitel illustriert, wie die Flexibilität des Begriffs Nachhaltigkeit für marginalisierte lokale BewohnerInnen von Vorteil sein kann. Die vorliegende Dissertation zeigt, dass der Wasserkraftboom, obwohl bislang weitgehend nur "auf dem Papier" existent, dennoch bereits reale materielle Konsequenzen für nachhaltige Entwicklungsstrategien, Korruption und das lokale Leben mit sich bringt.

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Foreword

"If this story is nothing, say storytellers in Africa, it belongs to the one who told it; if it is something, it belongs to all of us."
Ernst Bloch (1930)

When I conducted fieldwork for a hydropower project for the first time, it was 2011 and I was employed as a sociologist by an environmental consultancy company in Turkey. My team was supposed to conduct a follow-up study for an existing dam project to see if mitigation measures had been applied properly. During the fieldwork, I heard complaints by locals about the lack of transparency, false promises, and poor mitigation measures of the company. I remember an elderly man complaining, "I had walnut trees on my land but the company registered those as poplar trees instead". Indeed, poplar trees have much less economic value than walnut trees in Turkey. I heard complaints about trees being miscounted when calculating the compensation payments. I also heard about the formation of cracks in houses within the project site due to dam construction. These complaints were ignored by the investor and local authorities despite numerous complaints. The villagers were blaming local authorities for accepting bribe from the investors.

My second fieldwork for a hydropower project was for its social impact assessment in a small city in Turkey. I visited more than ten villages and led a big team that conducted a social impact assessment study in those villages. When we asked the villagers whether they supported the project, we repeatedly heard that reply: "I have no idea about the impacts or benefits of this project. No one informed us. But if it is for the benefit of *my* state, I will indeed support it". A reply clearly indicates a lack of proper public hearings about the project because the project stakeholders were not informed appropriately about the details that would change their lives. How could the public hearings papers have been valid then? When I inquired further about this issue during the fieldwork, I heard many people blaming village heads for only inviting those who supported the project to the public hearings in order to avoid any conflict. As claimed by villagers, the reason why village heads were not transparent to everyone was that they were bribed by the investors in order to avoid any opposition during the public hearing that could stall or even annul the project.

My third fieldwork experience was remarkable. I was again leading a team conducting a social impact assessment study in another small city in Turkey. One day at the fieldwork site, one social impact assessment department employee from the investors' office asked me to add one extra question to the household survey: that I enquire about the villagers' citizenship numbers. When I suspiciously asked why, he claimed that those numbers were necessary for some small project details. "Nothing very important", he added. When he was convinced that I did not believe him, he had to confess that it was to enact forced expropriation notice to some of the stakeholders who were not registered officially. This was to eliminate negotiations for compensation amounts between the investor and stakeholders. According to the law, this was supposed to be done by legal experts. However, an "alternative method" was to pretend that the stakeholders had not agreed with the visit of the experts, and hence, the investor "had to" ask the court for forced expropriation while handing in their citizenship numbers for identification. My reply was clear: "No way will I do that!" Later, another sociologist from the same

department was sent to accomplish this very duty. The first day she joined us for the fieldwork it was a nice spring day and we were offered tea and cookies under a tree in the garden of the village head. The sociologist on duty asked the village head if he would collect everyone's citizenship numbers and deliver them to her in a list. She said it was necessary for some small project details, "Nothing important", she added. I was in the meantime thinking how simple it was for her to deceive those people while looking into their eyes, resting under the shadow of their tree, drinking their tea, eating their cookies, and enjoying their jokes. "Of course," said the village head, "why not!" He started collecting the numbers. Meanwhile, the sociologist on duty was asking for another cup of tea. Long story short, the village head later decided not to give her the list. He got suspicious! How he did so is a secret between me and some other villagers.

Later, I took part in a few more hydropower projects. These first three experiences with the sector, as well as my later experiences, showed me how investors, decision-makers, and even employees who are in charge of impact assessments could be ignorant, corrupt and deceptive for their own personal gain. Unfortunately, I have not had a chance to visit any project site where stakeholders were informed fully, mitigation measures were applied properly, or socioenvironmental impact assessments were representative of the exact reality. My main concern was that if the hydropower sector was full of similar problems, how could one say that hydropower projects are sustainable?

Therefore, for my PhD, I decided to explore the hydropower boom in Turkey in depth. Yet, in the ninth months of my PhD, I was prohibited by the state from conducting any fieldwork in Turkey, otherwise I would face some troubles. Questions like "who, why, how" belong to a different research, not this one. To make a long story short, I had to find another case to study as soon as possible due to concerns related to finances and time. After a few months, I was convinced that Bosnia and Herzegovina could be a good alternative as it was going through a hydropower boom. In the second year of my doctoral research, I could finally start my fieldwork yet in different settings than I previously planned to be. I lost one year of work but I had a chance to explore another country where the settings were different than I knew before.

Besides the academic aspect of this thesis, this foreword is to explain the untold details of my research as I believe they also say a lot about this work.

January, 2020

Berlin

Chapter 1 - Introduction

1. Introduction

1.1. The global hydropower boom

Hydropower stands out as a significant energy source in the world generating 15.9% of the world's total electricity. It has the highest proportion (62.1%) of total global renewable energy sources (IHA, 2019). Total global hydropower potential is 1,292 gigawatts (GW)[1] and 21.8 GW of it was added in 2018 largely by China (8.54 GW), Brazil (3.87 GW), Pakistan (2.49 GW), and Turkey (1.09 GW) (IHA, 2019). China, Brazil, and the United States are the world's top three hydropower producers with 352 GW, 104 GW and 103 GW total installed capacity respectively (IHA, 2019). Major drivers for the production of hydropower are the expected benefits such as cost-effective flood control and water supply next to energy generation (Frey & Linke, 2002), poverty eradication and economic growth (IEA, 2000; Manzano-Agugliaro, Taher, Zapata-Sierra, Juaidi, & Montoya, 2017), and reductions in carbon emissions (Yüksel, 2010). It is claimed that exchanging conventional energy sources with hydropower would prevent the release of 148 million tonnes of particulates, 62 million tonnes of sulphur dioxide, and 8 million tonnes of nitrogen oxide[2] (IHA, 2018a). A "global hydropower boom" is the result with more than 3,700 hydropower projects planned[3] to be built especially in developing and transition countries (Zarfl et al., 2015; Figure 1-I).

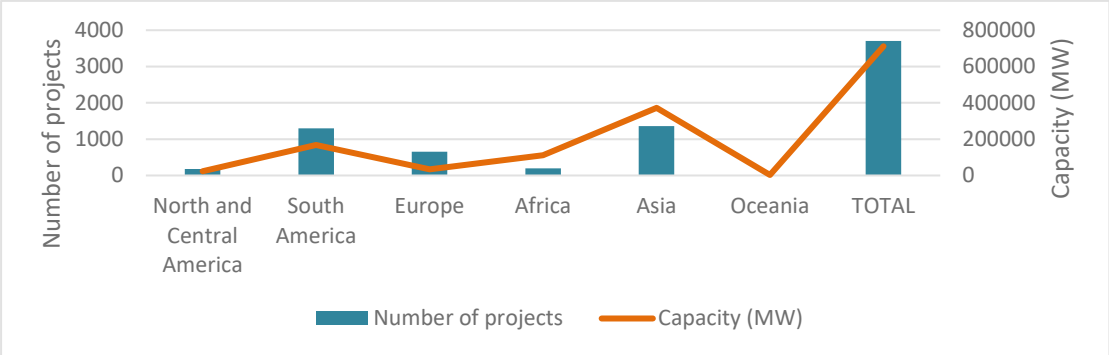

Figure 1-1 Continental distribution of planned and under construction hydropower projects with larger than 1 MW installed capacity by 2015[4]

There are various classifications of hydropower projects depending on their heights (high or low), storage capacities (run-of-river or reservoir), purposes (single or multi-purpose), and sizes (large, small, or micro) (Egré & Milewski, 2002). These categories are not mutually exclusive. For instance, run-of-river projects are often small or micro sized while large ones are multi-purpose, storing irrigation water for agriculture, managing flood regimes, and generating electricity. Due to the relatively small budgets of run-of-river projects and the multiple benefits of large dams, these two are the most popular hydropower plant types in the world (Zarfl et al., 2015; Figure 1-II). However, small projects have become more popular during the last two decades due to their expected small impacts (UNIDO & ICSHP, 2016b) when compared to the

[1] 1 petawatt (PW) = 10^6 gigawatt (GW) = 10^9 megawatt (MW) = 10^{12} kilowatt (KW)
[2] Some other researchers caution against substantial greenhouse gas emissions from hydropower reservoirs (see Gunkel, 2009; Siyue Li & Zhang, 2014).
[3] The total number of planned projects should be more than 3,700 considering that Zarfl, Lumsdon, Berlekamp, Tydecks, and Tockner (2015)'s study excludes projects with less than 1 MW installed capacity.
[4] Adapted from Zarfl et al. (2015)

considerable negative impacts of large dams, such as habitat change and modification of river flows (Egré & Milewski, 2002).

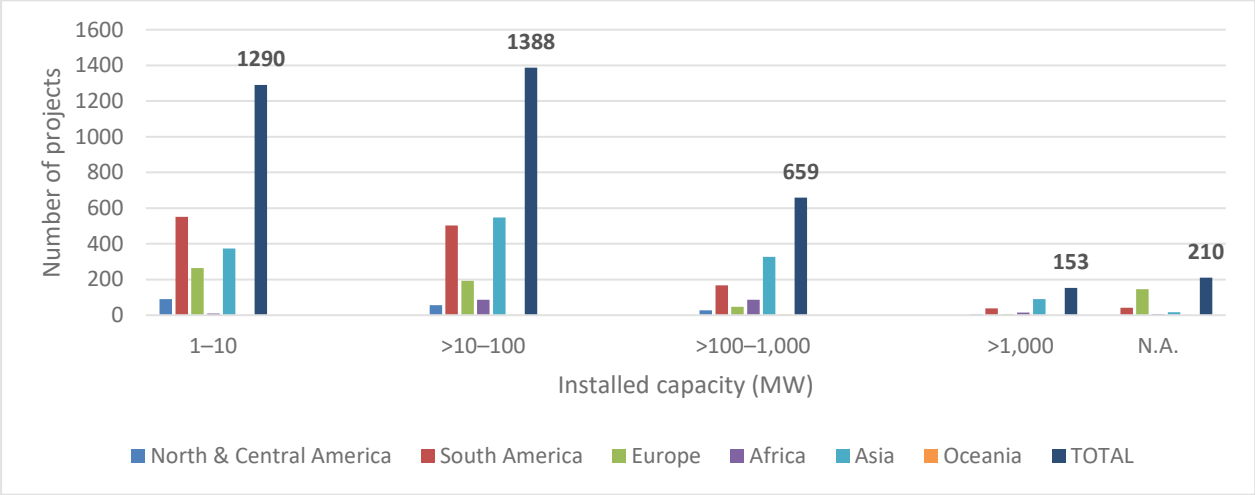

Figure 1-2 Distribution of the total planned and under construction hydropower plants according to their installed capacity and their locations[5]

Due to the expected advantages of hydropower projects, notably in terms of capacity to decrease carbon emissions, global development experts have put hydropower development at the top of the sustainable development agenda of many developing and transition countries with relatively high untapped technical hydropower potential (World Bank, 2017c; Yuksel, 2007), e.g. Nepal (USAID, 2018), India (World Bank, 2012), and Kyrgyzstan (Gassner, Merle-Beral, Terenteva, Rosenthal, & Hankinson, 2017). Pro-hydropower experts claim that if socio-environmental mitigation measures are identified, developed and implemented properly and future hydropower-related reforms are shaped by context, driven by outcomes, and informed by alternatives, hydropower development indeed promises a sustainable future for these countries and for the rest of the world (Foster & Rana, 2019; IFC, 2018). However, a large group of scholars oppose considering hydropower as a sustainable development strategy, arguing that the boom might instead result in weighty social and ecological consequences such as habitat deterioration, population displacement, loss of cultural heritage, loss of water resources and fish stock, reduction of access to livelihood opportunities, water grabbing, and increased public health vulnerability (e.g. Gleick, 1992; Kelly-Richards, Silber-Coats, Crootof, Tecklin, & Bauer, 2017; Zarfl et al., 2015). Furthermore, an increasing number of scholars claim that the assumption that "the smaller the project, the smaller the impact" is problematic because the cumulative ecological and social impacts of small projects might actually be greater than large projects (e.g. Benejam et al., 2016; Gleick, 1992; Kelly-Richards et al., 2017; Kibler & Tullos, 2013).

The debate for or against hydropower is still ongoing and the number of plants is gradually increasing worldwide. However, despite the large amount of attention that hydropower plants have received, statistics indicate that the actual materialisation and construction of hydropower plants does not match the plans (IHA, 2019). For instance, only 1.2% of the total globally planned capacity was materialised by 2018 (IHA, 2019). The reasons are many and complicated, but the emerging literature points to over-ambitious planning, a lack of funding

[5] N.A. (not applicable/available) indicates missing data for projects expected to be larger than 1 MW installed capacity. Adapted from Zarfl et al. (2015).

opportunities, and prevalent corruption in many of the countries that have contributed to the so-called "hydropower boom" (Haas, 2008; Lehner, Czisch, & Vassolo, 2005; Oud, 2002). Despite these few studies, this contradiction between planned and constructed hydropower plants is poorly understood in the hydropower literature. This thesis contributes to understanding this gap.

1.2. Thesis objective and research questions

In order to address this research gap, three research objectives drive this thesis:

(1) *to develop a better understanding of the global hydropower boom,*
(2) *to understand why this boom has not resulted in large-scale hydropower plant construction, and*
(3) *to use the hydropower boom to discuss the concept of sustainability.*

These objectives will be addressed examining the case of hydropower development in Bosnia and Herzegovina. Hydropower generation is an important sustainable development strategy in Bosnia and Herzegovina (hereafter BiH, derived from *Bosna i Hercegovina*) (IHA, 2016b). The total number of planned hydropower projects was about 315 in 2017 (Riverwatch & EuroNatur, 2018a). However, up until now, these plans have not resulted in any significant construction of hydropower plants in the country. To illustrate, in BiH, only 19 out of 315 hydropower plants were constructed by 2017 (Riverwatch & EuroNatur, 2018a). A comparable situation is observed in other South-East European countries and in many other countries throughout the world (Riverwatch & EuroNatur, 2018a). In order to examine one such non-materialised hydropower plant in a local context, I conducted fieldwork in the village of Martin Brod where two hydropower plants have been on paper since early 1950s and 1990s.

There is limited knowledge in terms of whether the planned projects are actually going to materialise considering existing environmental, economic, and socio-political conditions in many of these countries, including BiH. It is, however, an important issue to address in the interest of understanding the global hydropower boom by way of including its potential impacts better. Doing so will thus allow us to develop better development strategies and identify and tackle problems related to the hydropower sector. Can concerned environmentalists, for example, and hydropower supporters find common ground?

Three main research questions corresponding to the overall research objectives will be used to examine the case of hydropower development in BiH. The first two research questions are related to the first two objectives while the third addresses the third objective.

<u>Research Question 1:</u> Is the hydropower boom taking place in Bosnia and Herzegovina?

Chapter II addresses Research Question 1. By presenting insights from the hydropower sector in BiH based on a review of the existing research on the hydropower sector and fieldwork, i.e. interviews conducted with stakeholders (decision-makers, investors, experts, civil society organisations, local inhabitants), the chapter develops a better understanding of:

(a) how, in the context of hydropower development, sustainable development strategies are developed in BiH,
(b) the profile of the actors in charge of decision-making at various levels of the state and their perspective on the sector,
(c) why there is slow progress in hydropower project materialisation, and
(d) despite this slow progress, why the number of planned projects is increasing.

Corruption in the hydropower sector in BiH and globally is prevalent and generally due to large investment volumes and the highly complex administrative and construction structures of hydropower projects (Haas, 2008; Jennett, 2007; Shandling & Lock, 2008; Transparency International, 2008). The sector lacks transparency, public involvement, proper feasibility and impact assessments, and documentation of processes especially in transition countries such as BiH (Haas, 2008; Jennett, 2007). This opens the way for corruption which negatively affects most stages of hydropower projects (Campos, Lien, & Pradhan, 1999). Accordingly, corruption is put forward as a chief reason for the "melting away" of foreign investors in the BiH hydropower sector (Shandling & Lock, 2008). Despite these problems in the hydropower sector in BiH, in order to pursue the sustainable development strategy of the country, the number of planned projects is increasing alongside the global hydropower boom (Huđek, Žganec, & Pusch, 2020). The majority of these projects are small, i.e. 251 out of 315 hydropower plants would have less than 10 MW installed capacity (Riverwatch & EuroNatur, 2018a) and only 7% of the total amount of projects were under construction by 2015 (Muharemovic, 2016). This led me to explore the on-paper boom as a case study of corruption in the hydropower sector in BiH.

<u>Research Question 2:</u> How does the on-paper hydropower boom affect the increasing corruption risk in Bosnia and Herzegovina?

This question closely follows the insights gained by exploring points (c) and (d) mentioned above and is further explored in Chapter III.

Chapter III explores how this situation is connected to corruption in BiH and how this situation is also connected to the general neglect of corruption concerning small-scale projects in the literature that often focus on mega or very large-scale projects (e.g. Ansar, Flyvbjerg, Budzier, & Lunn, 2014; Gutierrez, Kelly, Cousins, & Sneddon, 2019; Locatelli, Mariani, Sainati, & Greco, 2017). This chapter addresses these issues by way of qualitative data collected during fieldwork (see Section 4). Interviews with decision-makers, investors, experts, and civil society organisations provided a comprehensive understanding of:

(a) corrupt actors in the hydropower sector,
(b) how these actors make use of the "invisible space",
(c) how corruption is perceived by different actors, and
(d) the ways in which corruption takes place.

Exploring the on-paper, or planned but not yet begun, hydropower boom in BiH led me to examine how sustainable development strategies and the hydropower sector are connected in BiH. I explored hydropower development as a sustainability goal, focusing especially on the village where I conducted most of my empirical research, namely Martin Brod village located in Federation of BiH (hereafter FBiH; see Section 2.2), and using the local inhabitants' perspective. The third research question was thus developed during fieldwork in Martin Brod and is addressed in Chapter IV.

<u>Research Question 3:</u> What opportunities can a flexible definition of the term "sustainability" bring to locals in Martin Brod village?

The term sustainability has been used prominently since the late 1980s (Schröter et al., 2017). Yet, due to its context-dependency (Weaver, 2006) it has a loose definition (Pintér, Hardi, Martinuzzi, & Hall, 2012) making it difficult to answer "what exactly should be sustained and for whom, when, and why" (Garrett & Latawiec, 2015, p. 12). The term's inherent flexibility creates an unstable ground for sustainability assessment (Alrøe & Noe, 2016) which paves the way for misuse (Lyon & Montgomery, 2015). Therefore, frameworks, definitions, indicators, and other tools have been developed to better determine the term's meaning (Tasaki & Kameyama, 2015). Yet these attempts have been critiqued for not adequately capturing and representing the dynamic interaction between social and ecological systems (Bell & Morse, 2008; Morse, 2013), hence the legitimacy of knowledge produced by them has been questioned (de Olde, Sautier, & Whitehead, 2018). The diversity of understandings and interpretations of sustainability have also resulted in the existence of multiple sustainability imaginaries (Cidell, 2017). These are almost always contested (L. K. Taylor & Zine, 2014) and transform over time due to changing internal and external conditions (Cidell, 2017). In sum, debates continue about the understanding of sustainability and the best strategies for implementing sustainable development strategies (Cierco Gomes, 2019; Lim, Søgaard Jørgensen, & Wyborn, 2018; Mundaca, Neij, Markandya, Hennicke, & Yan, 2016), including how local people could be better represented and/or take part in developing such determining frameworks (de Olde et al., 2018; Persson, Johansson, & Olsson, 2018; Reed, Dougill, & Baker, 2008). Yet, it is still not known what kind of opportunities a flexible definition of the sustainability term might bring people who are often under-represented in debates about sustainability.

Based on fieldwork, observations and interviews with people living in Martin Brod, Chapter IV specifically addresses:

(a) why inhabitants changed their understanding of hydropower projects in their village over time,
(b) the factors that facilitated this change from an anti- to pro-hydropower position, and
(c) how this process embedded sustainability imaginaries.

2. The empirical settings

2.1. Bosnia and Herzegovina

Bosnia and Herzegovina is in South-East Europe, bordering Croatia (north and west), Serbia (east) and Montenegro (southeast) (Figure 1-3). The total territory of the country is 51,197 square kilometres. BiH was one of the six republics of the Socialist Federal Republic of Yugoslavia (hereafter Yugoslavia; 1945–91) and consists of three dominant ethnic groups, Bosniaks (mainly Muslim), Serbs (mainly Orthodox Christian), Croats (Catholic), as well as Albanians, Montenegrins, and Roma. The dissolution of the Yugoslavian state started in 1991 due to, as stated by Crnobrnja (1993, p. 269), a combination of factors such as:

the national and other complexities that lay in the foundation of Yugoslavia; the Serb domination of the country […]; the traumas of the [previous] conflicts; the considerable economic differences between the republics; […] the new wave of aggressive nationalism […]; the rather confused state of collective security in Europe after the ending of the Cold War.

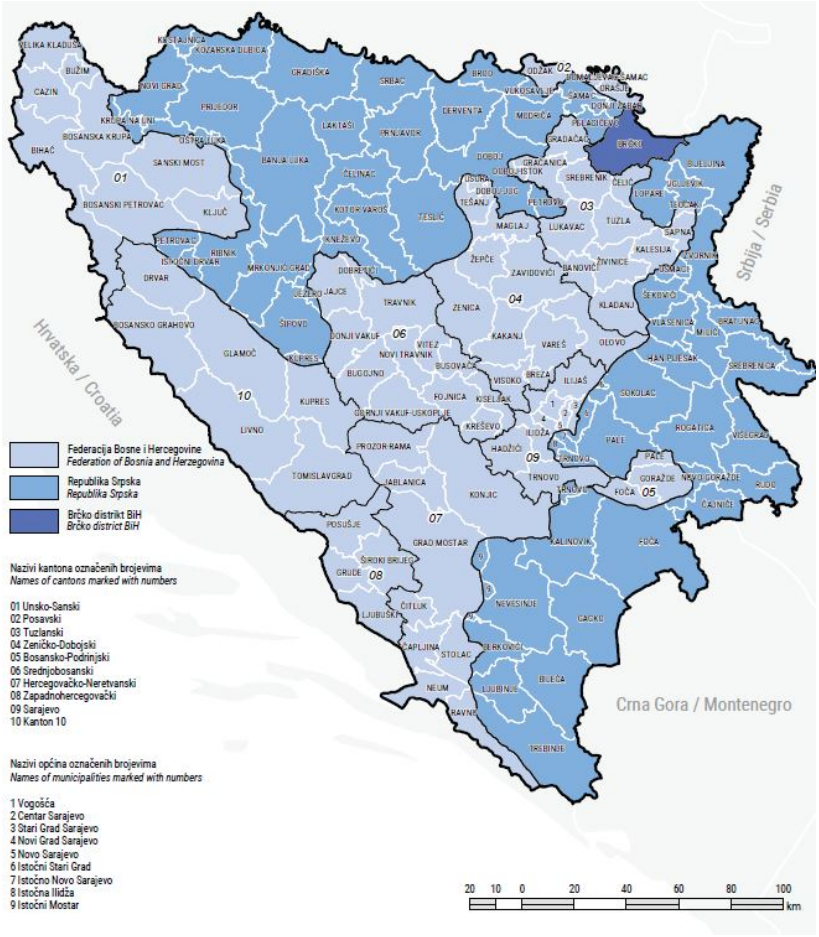

Figure 1-3 Administrative map of BiH[6]

On April 6, 1992, BiH was recognised as an independent state by the United States and the European Economic Community and this led to a tragic war, namely, the Bosnian War (1992–1995), between the three dominant ethnic groups in the country. According to Glenny (1996), because the country had no experience of independence since the medieval period, also due to its ethnic mix, the war, a result of conflicts of interests of different ethnic groups for the future of the country, was unavoidable. The number of people killed during the war is an estimated 67,530 (39.4% of this total were civilians), in addition, 2,140,544 people were internally displaced or became refugees (Tabeau & Bijak, 2005).

On December 14, 1995, a peace agreement, the Dayton Agreement, ended the war and separated the country into two autonomous entities – *Republika Srpska* (hereafter RS) and FBiH – and one semi-autonomous district, named Brčko, which is officially a condominium of the two autonomous entities. The presidency at the level of the state is tripartite with a chair that rotates every eight months. Figure 1-4, below, shows the administrative system of BiH. FBiH

[6] Source: BiH (2017)

is governed mainly by Bosniaks and Croats and RS is governed mainly by Serbs. In addition, FBiH was divided into ten autonomous cantons, each with their own autonomous governments and presidents (Divjak & Pugh, 2008). Sarajevo is the capital of both the national state and FBiH whereas the capital of RS is Banja Luka.

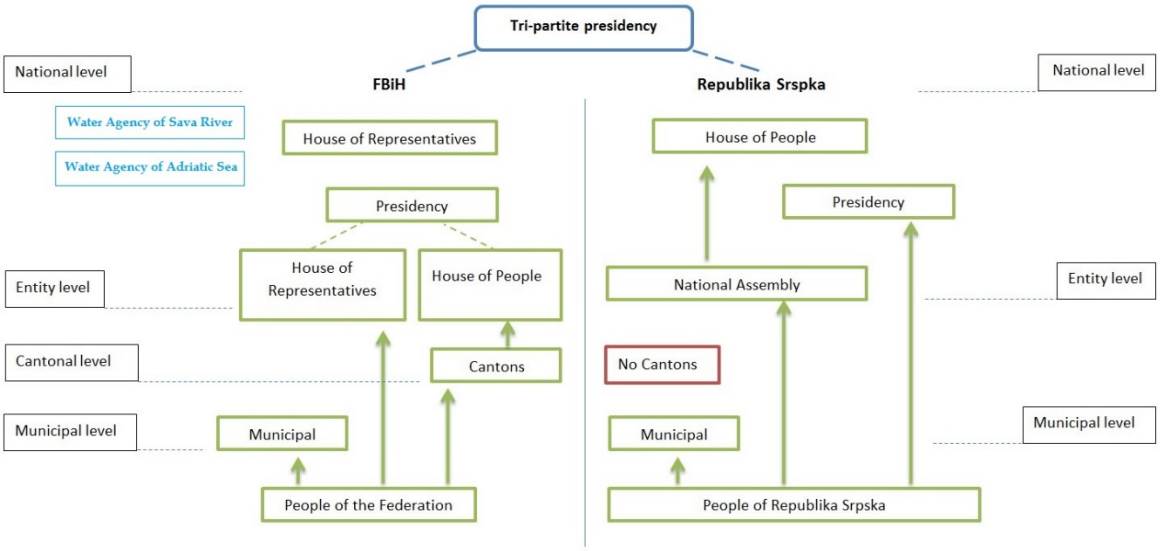

Figure 1-4 Administrative system of BiH

In 2013, when the last census took place, the total population of BiH was 3.5 million or 845,874 people less than the period immediately before the war. A decline in population density from 85.5% to 69.0% between pre-war period and 2013 has also been registered (BiH, 2017). In 2017, 55% of the total population lived in rural areas and the total population of the country was estimated to have declined by some 0.3 million compared to 2013 statistics (World Bank, 2017a). One of the reasons for this is emigration, which occurs at an annual rate of 3% (World Bank, 2017d). One reason for emigration is the high unemployment rate. In 2019, the unemployment rate was 15.7% (of the total labour force), whereas the labour force participation rate (of the working-age population) was 41.8% (ILO, 2019).

In the immediate aftermath of the civil war, the country became highly dependent on foreign aid (Pugh, 2002) and it has undergone a double transition, namely from war to peace and from a socialist to a market-oriented economy (Belloni & Strazzari, 2014; Ohanyan, 2002). The privatisation of the economy was strongly encouraged by the World Bank and the European Union (Adams, 1991; Ding & Sherif, 1997; Peet & Hartwick, 2015). The government of BiH accordingly began reforming various aspects of the economy. A wide range of laws, such as the Privatisation Agency Law, the Law on the Privatisation of Enterprises, the Law on Restitution, and the Law on Privatisation of Banks, were introduced to encourage market reforms towards, for example, the privatisation of public enterprises and assets (Tzifakis & Tsardanidis, 2006). BiH's EU application in 2016, strongly supported by various international development agencies, such as the United States Agency for International Aid, the German Corporation for International Cooperation, and the United Nations Development Programme (UNDP, 2009), further promoted a market-oriented approach to development which resulted in more legal rearrangements towards privatisation of various sectors (EU, 2018). In the energy sector, key changes and rearrangements were undertaken for the purchase of renewable energy

(FERK, 2016), electricity price (FERK, 2014b), and feed-in tariff details (FERK, 2014a). In sum, a broad socio-economic and socio-political transition has been the result.

Despite the promising progress in the country's economy in the early 2000s, e.g. the average estimated annual growth rate was 3.6% in 2005 (Dell'Anno & Piirisild, 2007), it was only after 2010 that pre-war per capita GDP levels were returned to and the unemployment rate remained the same between 2000 and 2015 (Pugh, 2017). Pugh (2017, pp. 236-237) claims that "[w]ith billions of dollars of foreign aid and expertise, and in spite of major achievements, such as a complete uprooting of the banking system, transformation remains partial and unlikely to meet the World Bank's Framework goals for 2016–20". Pugh (2017) highlights the prevalent corruption in the country as one chief reason for this economic situation.

Corruption is indeed widespread in BiH. According to the 2018 Transparency International Index (2019), the country's corruption perception score was 38 out of 100 (0 is for highly corrupt, 100 for very clean) and it placed 89th among 180 countries. For comparison, Denmark, with a score of 88, was ranked first whereas Somalia, scoring 10, was seated at the bottom of the list (Transparency International, 2019). According to a survey conducted by the United Nations Office on Drugs and Crime in 2011, 20.1% of BiH citizens between the ages of 18 and 64 had experienced a bribery case at least once within the last year (UNODC, 2011). 20.7% of those who had experienced bribery said that they had been giving bribes an average of every ten weeks to public officials (UNODC, 2011). Additionally, although global corruption is generally an urban phenomenon, corruption in BiH also takes place in rural areas (UNODC, 2011).

It was especially after the Dayton Agreement that corruption became a "standard operating procedure" in the country (Belloni, 2020, p. 58). The fragmented state structure and legislative framework are argued to be the main reasons for this (Belloni & Strazzari, 2014; Bosso, 2014; Divjak & Pugh, 2008). However, according to Pugh (2017, p. 237), it is essentially the existing oligarchy in BiH that allows privileged groups to accumulate capital through manipulating privatisation processes, i.e. authorising "rights and entitlements to wealth, and […] rentier operations" for private gain. It is also argued that the oligarchy in BiH has bent social norms to reflect new power configurations which meant that "deviant" behaviour, i.e. corruption, became tolerated due to post-war exceptional circumstances (Belloni, 2020).

2.1.1. The hydropower boom in Bosnia and Herzegovina

Yugoslavia's transformation from being a mainly agricultural country to becoming an industrialised one created a need for power for the modernisation of industrial production and stimulation of growth in all regions of the country (Suica, 1971). In 1968, about half of the generated energy was produced by hydropower plants and in the 1970s Yugoslavia was the most hydropower-rich country in the region with plans to add 3.2 GW more on top of the total installed hydropower capacity of 2.8 GW (Antonshin, 1974). At the beginning of 1970s, there was 10^9 kilowatt-hour (kWh)/year untapped technical hydropower potential (Sektorov & Poltoratskaya, 1970; see Figure 1-V). However, the death of the then president Tito in 1980 and the outbreak of the Bosnian War resulted in the postponement of hydropower development plans until the 2000s.

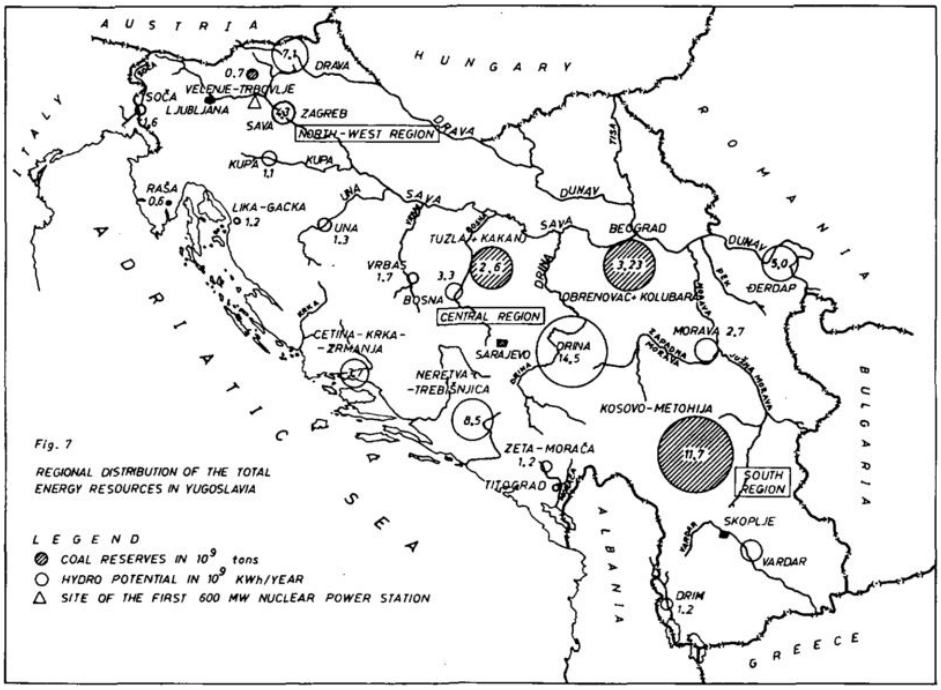

Figure 1-5 Regional distribution of the total energy resources in Yugoslavia in the 1970s[7]

The central Dinaric Alps make BiH a mountainous country and rich in terms of water resources (Figure 1-6). Inland surface water run-off is around 19,250 L/min in total and mean annual precipitation is 1,250 L/min whereas the European average is 1,000 L/min (BiH, 2015c). After the war, the transition to a market-oriented economy paved the way for private hydropower development which has become a major (potential) driver of sustainable development in the country (Karakosta, Flouri, Dimopoulou, & Psarras, 2012; Lalic, Popovski, Gecevska, Vasilevska, & Tesic, 2011; Lekic, 2008; Maric, 2009; Scholl, 2009). As in most other developing and transitioning countries in the world, the market is thus increasingly considered to be the best way to handle economic and environmental problems simultaneously (Du Pisani, 2006; Vatn, 2015).

Figure 1-6 Topographic map of BiH

[7] Source: Suica (1971)

According to the EU energy strategies, BiH's targeted gross final energy consumption to be achieved by 2020 is 40% (EU, 2009b) – the highest amongst all southern European countries. Compare, for example, Macedonia at 28%, Serbia at 27%, and Croatia at 20% (UNIDO and ICSHP, 2016a). As stated in the BiH National Renewable Energy Action Plan, the target is to build more hydropower plants with a total of 0.7 GW installed capacity by 2020 (BiH, 2016a). In 2015, a total of 206 hydropower plant concessions were granted, 133 of which are small size projects, meaning below 10 MW installed capacity (Riverwatch & EuroNatur, 2015). In 2016, the total number of planned projects increased to 296 and in 2017 to more than 315 (Riverwatch & EuroNatur, 2017, 2018a). The same progress is not observed for the total installed capacity of hydropower potential in the country (UNIDO & ICSHP, 2016a). For instance, between 2006 and 2011, only three hydropower plants were built throughout the country (CIN, 2015). Similarly, in 2016, only 7% of the total projects were under construction (Figure 1-7). According to some scholars, this slow progress is mainly due to the absence of consistent development strategies, necessary legal background, and a convenient environment for investments at the country level (Dolecek & Karabegovic, 2013; Karakosta et al., 2012; Lalic et al., 2011), i.e. problems that are mainly related to water management and hydropower bureaucracy.

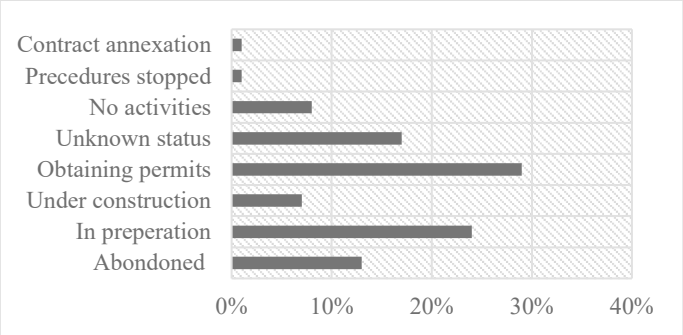

Figure 1-7 The distribution of hydropower plant projects per phase in BiH in 2016[8]

2.1.1.1. Water management

In BiH, there are two main river basins, namely the Black Sea basin and the Adriatic Sea basin. According to the BiH Constitution (as defined in Dayton), the competences over water management reside with the entities in addition to the state of BiH (FBiH, 2012).

In FBiH, there are two water agencies, the Water Agency of the Sava River and the Water Agency of the Adriatic Sea, additionally the Federal Ministry of Agriculture, Water Management and Forestry are responsible for water management. Cantons within FBiH are also responsible for regulating natural resource use and this shared responsibility may be exercised independently or in collaboration with other autonomous units depending on whether it is a transboundary watercourse (FBiH, 2012). The FBiH authorities are bound to take into consideration the cantonal competences and the particularities of different cantons (FBiH, 2012). In RS, however, due to absence of cantonal administrative levels, water management is only under the jurisdiction of the Ministry of Agriculture, Forestry and Water Management of RS (Government of Republic of Srspka, 2019). Since the Dayton Agreement does not contain specific provisions for water management in the semi-autonomous units, the BiH authorities

[8] Adapted from Muharemovic (2016)

have no competence over inter-entity relations and there is no institution that can solve any possible controversies and disputes regarding the management of shared water resources (FBiH, 2012).

According to the BiH Constitution, water is a public good. In the Law of Water Management of the FBiH, dated 2003, the term "water management" embraces issues like protection of water resources intended for human consumption, flood control, maintenance of water resources and facilities, and included issues associated with water property, territorial water management and the role of the public office in water management. However, water institutions and agencies in FBiH and in the cantons are insufficiently staffed for fulfilling all the tasks required (FBiH, 2012).

For private hydropower stakeholders, a water concession is needed. This entails the granting of water-use rights by public bodies to a private investor to generate electricity at a specific location and for a specific period of time (PPPIRC, 2017). It is the responsibility of FBiH to award water concessions for hydropower plants above 5 MW installed capacity, while smaller ones are under the competence of the cantons. Despite the fact that the cantonal laws, acts and practices are required to be harmonised with the FBiH regulations, no information on the awarded concessions by the Cantons are delivered to the Ministry, and the concession charges are not harmonised at the federal level (FBiH, 2012). At the federal level, a concession is awarded under the authority of the Ministry of Energy, Mining and Industry of FBiH (FBiH, 2012). In BiH, hydropower concessions generally have a duration of 30 years with the possibility of extension.

2.1.1.2. Hydropower bureaucracy

In BiH, key administrative steps involved in a hydropower project start with the identification of a potential location, either by an interested investor or a responsible authority. For the latter, and depending on project size, the ministry in charge within that administrative unit invites bidders for the project and each applicant has to submit a feasibility study. If a private investor shows interest first, the bidding step is skipped while the rest of the procedures remain the same. For both cases, the procedure continues with obtaining the concession and other permits for the hydropower project from different authorities.

The procedure for permit gathering and obtaining concessions depends on the location, size and type of the project. For instance, in FBiH, a hydropower project of up to 1 MW installed capacity is under the authority of the municipality of the project location, while a hydropower project of 1–5 MW installed capacity is under the authority of the canton at the project location. If a hydropower project is located on a transboundary watercourse (between entities or crossing into another country) it is under the authority of the state's administrative units.

In practice, this means that a hydropower plant can fall under various administrative units. To illustrate, the responsibilities for hydropower investments in FBiH are distributed among 79 municipalities, 30 cantonal ministries, 12 concession commissions and three federal ministries. In addition, two water agencies are involved in the administrative process that concerns the measures required to construct a hydropower plant on big watercourses.

2.2. Martin Brod village

Martin Brod village belongs to the Municipality of Bihać of the Una-Sana Canton which is administratively under the rule of the FBiH (Figure 1-8). The village is within the borders of the Una National Park (hereafter UNP), which was established in 2008 and began to operate in 2011. Martin Brod is a water-rich village as the rivers Una and Unac run through it, in addition to several connected creeks, and the velocity of the water flow is also relatively high (Spahić, Korjenic, & Hrelja, 2014). From around 1970s until the Bosnian war, there was a mini hydropower plant (0.06 MW installed capacity) that generated electricity for the village, yet it has not been operational since the war.

Figure 1-8 The location of Martin Brod village and its major waterfalls

Before World War II (1939–45), Martin Brod was a prosperous village. However, after the Bosnian war, less than half of the original inhabitants returned and those were mostly elderly people. The primary reason for this was the lack of employment opportunities in the village due to the fact that the railway station and the public utilities, which had provided income opportunities for the inhabitants after the Bosnian War, were permanently closed. Renting rooms and providing food and services to fly-fishers became the main income sources in the village between 1995 and 2011, when the Una National Park prohibited the release of non-native fish species into the rivers within the park's territory due to nature conservation policies.

The UNP covers 19,800 hectares and "performs activities of protection, maintenance and promotion of the National Park […] and supervises the implementation of the conditions and nature protection measures in the managed area" (Nacionalni Park Una, 2019). According to the UNP Law, it is forbidden within the vicinity of the UNP to build new facilities and infrastructure for power supply. The only exception from this prohibition are facilities and infrastructure that use renewable resources, those that meet the needs of the locals and the

activities of the UNP, and infrastructures without reservoirs. It is forbidden to take any action that would change the water regime or of the shape of the riverbeds except when it is needed for flood and erosion protection and as a drinking water supply or against any other harmful effects to the existing water resources.

3. Theoretical perspectives

3.1. Making sense of the sustainability term

The most widely used definition of sustainability is from the "Our Common Future" report of the Brundtland Commission. The report defines sustainability as something that "meet the needs of the present without compromising the ability of future generations to meet their own needs" (WCED, 1987). Along with this definition, the term has a variety of other definitions and derivatives such as sustainable development, social sustainability, etc. (Shkliarevsky, 2015). A Google search reviewed by White (2013), for instance, shows that there were at least 100 unique definitions of sustainability at the time that the research was done. Waas, Hugé, Verbruggen, and Wright (2011) explain this variety as a result of two things: the deliberate misuse of the term to disguise business-as-usual activities and the term's overuse without understanding of its original meaning. Scholars ascribe the latter to the multifaceted nature of the term (Christen & Schmidt, 2012; Sikdar, 2003; White, 2013). This is exemplified in Chasin's (2014) study, "Sustainability: Are We All Talking About the Same Thing?", which showed that more than half of the reviewed 66 articles, within the field of information systems dealing with sustainability issue, provided no explicit definition of the term.

The discourse on sustainability goes back at least until the age of Enlightenment, but the term's present form emerged at the beginning of the 1970s (Chasin, 2014; Kuhlman & Farrington, 2010). Since then, discussions of sustainability have risen to a new level as sustainability has been classified as a prominent issue for the world (WCED, 1987). For instance, the UN's first world conference on sustainable development in 1992, known as the first Earth Summit, attracted many world leaders concerned about how to achieve sustainable development within the biophysical limits of the earth (Shkliarevsky, 2015), or how to reconcile economic growth with environmental protection (Waas et al., 2011). Adding a sustainability component into socioeconomic development plans has since then been broadly considered the best way to address complex environmental and societal problems in favour of both present and future generations (Waas et al., 2011).

Therefore, defining the term sustainability is important as its definition enables its operationalisation and measurement (Alrøe & Noe, 2016; Epstein & Buhovac, 2010; Tricco et al., 2016). It also allows us to identify "what exactly should be sustained and for whom, when, and why" (Garrett & Latawiec, 2015, p. 12). Subsequently, with the intention of answering this question of its definition, improved sustainability frameworks have been developed (Pintér et al., 2012). Hence, there have been many different attempts to describe, define, clarify, classify, and explore sustainability. Its most renowned so-called fundamental objective values are ecological (planet; biodiversity, beauty of landscape, etc.), social (people; equity, health and cultural values, etc.), and economic (profits; costs and economic payoffs, etc.) (Kemp & Martens, 2007). Nevertheless, there are controversies among sustainability scientists and decision-makers in terms of identifying which pillar should be prioritised. For instance, Hansmann, Mieg, and Frischknecht (2012) state that economic growth should be improved

primarily as this will improve environmental and social sustainability. Opponents of this claim argue that improving and balancing social and environmental sustainability would primarily provide for economic benefits (e.g. Aguilera, Rupp, Williams, & Ganapathi, 2007; Porter & Kramer, 2006).

Two practical approaches to sustainability have also emerged: weak and strong sustainability. While weak sustainability means "developing renewable resources, creating substitutes for non-renewable resources, making more effective use of existing resources, and/or by searching for technological solutions to problems such as resource depletion and pollution", strong sustainability means to "focus upon changing the demands made on the Earth [and] to protect natural ecosystems", not for the pleasure of people, but to protect Nature's inherent rights (Williams & Millington, 2004, pp. 100, 102).

Trying to avoid "constantly being held up by the politics of value choices" (Lélé & Norgaard, 1996, p. 356), a group of scholars and decision-makers continue defining improved instruments, frameworks, tools, indicators, etc. (Christen & Schmidt, 2012; Hicks et al., 2016) that can better assess sustainability (Bizikova & Pinter, 2017, p. 1). Other groups of researchers arguing against this, say that such efforts are not suitable to represent the dynamic interaction between social and ecological systems that define sustainability, or that such efforts are, in effect, too simplistic (Bell & Morse, 2008; Morse, 2013). The second group argues that those attempts "have often suffered from insufficient attention to overlaps and interdependencies and a tendency to facilitate continued separation of societal economic, and ecological analyses (Kemp & Martens, 2007; Kemp, Parto, & Gibson, 2005). Hence, it is argued that those attempts fail to recognise that (a) different actors have different sustainability, or sustainable development definitions and solutions that are often sustainable within one sector, or place, and not across all, (b) new risks emerge with new developments meaning that sustainable development predictions cannot be certain (P. Becker, 2014), (c) sustainability precedes and supersedes terms of elected governments, and (d) the concept inherently involves contested issues (Farrell, Kemp, Hinterberger, Rammel, & Ziegler, 2005; Kemp & Martens, 2007). Central to this critique is an understanding of nature and society as being in constant flux and hence ultimately unmeasurable (see Alrøe & Noe, 2016; de Olde et al., 2018; Rigolot, 2018). Furthermore, a third group of researchers stand in the middle of these two opposing views and develop alternative approaches, such as participatory and reflexive approaches that highlight the subjectivity of the concept (e.g. Fraser, Dougill, Mabee, Reed, & McAlpine, 2006; Hicks et al., 2016; Reed et al., 2008). Lélé and Norgaard (1996, p. 361), for instance, argue that an objective sustainability assessment, i.e. separating sustainability from subjectivity, ethics, and politics, is not possible due to the term being related to subjective concepts such as risk and need (Amsler, 2009). The term "sustainability" consequently represents different perspectives that are different across nations and localities and cannot represent an objective entity for all (Kemp & Martens, 2007). Hence, reflexivity is considered the only way to achieve sustainability, i.e. to deal with complex, indefinite, and multifaceted issues, because reflexivity allows learning about our actual and contextual needs (Kemp & Martens, 2007). In this sense, the flexibility of the term is not a problem, but rather, an advantage, as being reflexive regarding the term allows "critical reflection on the desirability of present social conditions" and the creation of possibilities "for imagining alternative futures" (Amsler, 2009, p. 115). Sustainability is not, thus, an end product but is instead a process, just as normativite research has been argued to be (J. Ø. Nielsen et al., 2019).

Chapter IV takes up and uses this debate in order to discuss whether the flexible definition of sustainability could be beneficial for marginalised groups. It is also done so benefitting from sustainable imaginaries literature.

3.2. Corruption in social sciences

The English term corruption is derived from the Latin word *corruptus* meaning to rot or decay and implying a change from "good" to "bad" (Robbins, 2000). In Turkish, the term is "*yolsuzluk*". Its meaning was translated from the Latin word *incivilis* (uncivil) which indicates to act amorally or in a manner that is shameless. In Arabic, it is فساد (*fasad*) meaning to deteriorate, to lose its function. In Chinese, it is the word 贪污 (*tanwu*), the combination of two words 贪 (to have an insatiable desire for) and 污 (dirt, sewage). Clearly, in different languages, it has different meanings yet in all societies, it indicates a certain type of deviation from "good" (Rothstein & Varraich, 2017) which commonly indicates private gain at public expense (Dion, 2010; LaPalombara, 1994) where participants are both corrupters and corrupted (Hankiss, 2002).

Corruption is "an old, widespread, and multifaceted phenomenon" (Sekkat, 2018, p. 1) and there is no unitary working definition of the term in the social sciences that deals with the phenomenon (Farrales, 2005). Its complexity refers to its social, economic and political aspects as well as its high cultural variability (Abed & Davoodi, 2000; Torsello, 2010a). Acknowledging this complexity, a growing body of literature has studied the social, situational, and individual causes of corruption (Köbis, Iragorri-Carter, & Starke, 2017). The overall approach in term of identifying its causes is to relate them to "the geography and history of a country, its political and institutional systems, the characteristics of its population and its economic structure, and the corruption system itself" (Sekkat, 2018, p. 71). In general, corruption takes place at five different levels, i.e., at the level of (i) principles (ontic/spiritual/axiological corruption), (ii) moral behaviour (moral corruption), (iii) people (social corruption), (iv) organisations (institutional corruption) and (v) states (national/societal/cultural corruption) (Dion, 2010). Additionally, it has a variety of types (political, bureaucratic, and institutional corruption) (Knack, 2007), forms (bribery, embezzlement, fraud, and extortion), and sizes (petty, grand, etc.) (Kostadinova, 2012; Rohwer, 2009).

Scientists approach corruption in diverse ways in order to understand inherent personal reasons behind it, such as (a) the rational choice of individuals, e.g. *homo oeconomicus,* (b) a result of gaps of economic and political institutions, and (c) a consequence of socio-historical conditions (Torsello, 2010a). Yet, when taken individually, each of these three approaches have their own weaknesses. To be more specific, the *homo oeconomicus* perspective does not make a proper distinction between public and private interest; the institutionalist perspective lacks a proper explanation for why both weak and excessive state controls foster corruption to the same extent; and the socio-historical perspective is reductive in that it considers that corruption mainly takes place in countries with particular socio-economic and cultural features (Torsello, 2010a).

Corruption has significant and far-reaching implications[9] (Cole, 2007) which are mainly economic (e.g. increasing transaction costs (Goorha, 2000)), political (e.g. posing difficulties

[9] Despite the fact that there is a burgeoning body of literature discussing the negative implications of corruption, there are also a few scholars claim that corruption might actually contribute economic growth positively (e.g.

for consolidation of democracy (Inokoba & Ibegu, 2011)) and social (e.g. decrease in quality of education (Bachore, 2014)). From an economic point of view, by hindering economic activity, corruption reduces the effectiveness of industrial policies and encourages businesses "to operate in the unofficial sector in violation of tax and regulatory laws" (Goorha, 2000, p. 80). Although its exact economic impact is difficult to assess (Sekkat, 2018), in 2014, it was estimated that its total financial cost was more than 5% of the global GDP (Heywood & Rose, 2014). From a socio-political point of view, when it distorts markets and fair competition, it also "undermines the rule of law, damages government legitimacy, breeds dishonesty in society, erodes the private sector" and contributes to income inequality (Sergi & Qerimi, 2007, p. 81).

Because corruption has many faces (Rohwer, 2009) and lacks "a universal, one-dimensional, normative, and procedural definition" (Rothstein, 2014, p. 737), it is problematic to establish "how best to measure [it] and how to develop effective guides to action from such measurement" (Heywood & Rose, 2014, p. 507). In addition, corrupt transactions are not recorded (Robbins, 2000) which makes their measurement elusive (Warf, 2019). Yet, to some scholars, measurement is still possible if informed views of relevant stakeholders are gathered, if countries' institutional features are tracked, and if specific projects are carefully audited (e.g. Heywood, 2015; Johnston, 2017; Kaufmann, Kraay, & Mastruzzi, 2007; Philp, 2016) in order to actually research corruption. Measuring corruption might, however, create a "corruption trap", defined as imposing corruption reduction as one condition for development aid in countries where corruption is endemic (Andersson & Heywood, 2009), such as transition countries (Szarek-Mason, 2010a). Identifying and measuring corruption, while necessary to understand the phenomenon, might thus result in major cut-off of development aid crucial for many countries leaving them paradoxically with almost no chance to implement anti-corruption reforms (Szarek-Mason, 2010b).

Chapter II and III mainly draw on this theoretical perspective in order to analyse whether the hydropower boom is actually taking place and, if not, what kind of implications it might have considering the boom in the number of hydropower plans. Chapter II explains why the hydropower boom is unlikely to take place in Bosnia and Herzegovina to the extent foreseen while Chapter III takes this explanation further in order to discuss potential consequences of sustainability strategies in countries where corruption is prevalent.

3.3. Sustainable development in countries where corruption is rife

Corruption is a worldwide phenomenon but it is more prevalent in some countries than others (Köbis et al., 2017). It is especially prevalent in post-socialist transition countries in terms of both actual occurrence and perception (Zurnić, 2019). Transition countries are 'fragile' states due to the fact that they are in the process of rebuilding their social, political, and legal structure, and these factors have been shown to pave the way for organised crime (Kassab & Rosen, 2018). To put it differently, in transition countries, economic reforms create structural opportunities for corruption and weak regulatory frameworks causing insufficient and ineffective judicial systems (Zurnić, 2019). Moreover, prevalent corruption in transition countries lead to a lack of institutional development that could deal with corruption (Goorha, 2000). In other words, there is a circular structure where being in transition proliferates

Huntington & Fukuyama, 2006; Leff, 1964) because corrupt practices might avoid bureaucratic delays and corrupt government employees might work harder to receive more bribes (Mauro, 1995).

corruption while proliferated corruption hampers transition, arising from the complex character of transition (Kostadinova, 2012).

Zaloznaya (2017, pp. 1-2) argues that in transition countries, it is often bureaucratic corruption that is pervasive because of "everyday illicit exchanges between ordinary people and bureaucratic service providers [that] are shaped by new hybrid regimes". Corruption becomes an everyday phenomenon in such contexts because it is challenging for these countries to define how the state should interact with firms and individuals and, more importantly, how firms influence the state (Hellman, Jones, & Kaufmann, 2000). The latter is notable because "[s]ome firms in transition economies have been able to shape the rules of the game to their own advantage" creating a "capture economy" where "public officials and politicians privately sell underprovided public goods and a range of rent-generating advantages" to private firms (Hellman et al., 2000, p. i).

Prevalent corruption is self-reinforcing, meaning that governing institutions are ineffective at detecting and prosecuting corruption, which results in people committing corrupt acts more often (Köbis et al., 2017). Furthermore, anti-corruption interventions of international organisations in the form of reforms do not generally remedy pervasive corruption because they often do not change patterns of behaviour (Jackson, 2017). This is especially so in Eastern European countries where "oligarchs nurture criminal networks, exert direct control over the judiciary, and divert public resources toward private purposes" (Warf, 2019, p. 72). When the increasing market mentality natural to transition countries meets pervasive oligarchic relations, judicial, political, and administrative structures are undermined (Hutchcroft, 2002). Moreover, under those conditions and when a strong judiciary is essential for an effective socioeconomic transition, it becomes a means of corruption, i.e. "the best judiciary money can buy" (Hutchcroft, 2002, p. 115).

While corruption hinders economic (Theobald, 1989), political (Nye, 1967), environmental development (Pellegrini, 2011), it also creates barriers to sustainable development (Aidt, 2011). For instance, in Nigeria, corrupt oligarchs syphoned off public sustainable development funds which not only hampered sustainable development but also fed the culture of corruption in society (Agba, 2010; Atelhe, 2014; Omadjohwoefe, 2014). In another case, Aidt (2011) exemplifies how funds for better schooling were justified from a sustainable development point of view in Uganda yet the funds did not reach schools. Or, in another case, corrupt officials sell public licences for rent-seeking, thus undermining sustainable development criteria (Aidt, 2011). In transition countries where corruption is rife, the transition to a market economy through privatisation of public assets is therefore a challenge (Tanzi, 1998). It is especially in term of making estimations of sustainable development progress. It is because although statistics might indicate an increase in the amount of sustainability investments, those investments are with poor quality of infrastructure and do not meet the sustainability standards (Tanzi, 1998). The level of tax evasion also affects the level of sustainable development negatively since when taxpayers fail to comply with tax legislation, this decreases the welfare in a country as well as social and environmental sustainability (Khlif, Guidara, & Hussainey, 2016). In addition, if taxpayers believe that their government is not transparent in terms of allocating fiscal revenues, it might discourage them to comply with fiscal rules (Khlif et al., 2016). Increasing sustainable development funds therefore poses a threat to materialisation of sustainable development strategies because, as argued by Adams (1991), too much money in the wrong hands causes environmental problems. To illustrate this, Magda Renner of Friends of the World argued that "Brazil's environmental and the world's financial system would be a

lot better off if the international financiers had just kept their money" (Adams, 1991, p. 53). Moreover, when corruption could be a challenge on the way to achieve sustainable development (Gbadamosi, 2006; Morse, 2006), it could be that sustainable development strategies feed the culture of corruption as well.

Drawing from this discussion, Chapter III shows, how small-scale hydropower projects are used by various actors for personal benefit, considering that corruption is rife in the hydropower sector and closely connected to the sustainable development discourse in BiH.

4. Methodology

4.1. Research approach

This thesis is a case study of the hydropower boom in BiH. A case study investigates the subject of study, or case, "in-depth and within its real-world context, especially when the boundaries between phenomenon and context may not be clearly evident" (Yin, 2018, p. 14). In other words, it is a contextual, in-depth and thorough examination of the case (Baxter, 2010; Flyvbjerg & Seale, 2007) that illuminates why and how something (e.g. decisions, processes, programs, events) happened and what the consequences were (Schramm, 1971; Yin, 2018). Therefore, a case study is categorised as a methodology rather than as a method (Baxter, 2010; Feagin, Orum, & Sjoberg, 1991). This is also because:

> *there are important philosophical assumptions about the nature of research and that support the value of case research. The primary guiding philosophical assumption is that in-depth understanding about one manifestation of a phenomenon (a case) is valuable on its own without specific regard to how the phenomenon is manifest in cases that are not studied (Baxter, 2010, p. 82).*

While being distinctive, case study research that covers central procedures of all modes of social science research and method selection depends on whether it is a descriptive, exploratory, or explanatory study (Gerring, 2007; Yin, 2018). Method selection also depends on whether it would be a representational sample or a useful variation of the dimensions of theoretical interest (Seawright & Gerring, 2008). Therefore, a case study can make use of both qualitative and quantitative social science methods. Qualitative data could be used to describe a phenomenon in detail, to look for explanations for differences between different cases, and/or to develop a theory of the phenomenon studied (Flick, 2014) whereas quantitative methods include collecting, analysing, interpreting, and presenting numerical information (Teddlie & Tashakkori, 2009).

Case study research has been critiqued for being subjective (Hammersley, 2008; Sampson, 2004; Sherif, 2001). Indeed, the social inquiry such that is a part of most case studies allows more room for subjectivity rather than quantitative research (Flyvbjerg & Seale, 2007; Hammersley, 2008). This is due to the blurred boundaries between the "Self" and the "Other", i.e. between researcher and researched subject (Sherif, 2001). Yet, Flyvbjerg and Seale (2007, p. 235) argue against those who claim that a case study is an arbitrary judgement by the researcher and thus less rigorous than quantitative research. In addition, they state that such critiques represent a lack of knowledge of case studies because "a case study has its own rigor [as] it can 'close in' on real-life situations and test views directly in relation to phenomena as they unfold in practice". Moreover, Hammersley (2008) argues that the reflexivity of social

inquiry does not necessarily undermine researchers' commitment to realism – except to naïve forms of realism in which knowledge must be based on absolute foundations.

Another limitation often raised in relation to case study research is the generalisability of findings as these are context specific (Hammersley, 2008). However, if a case is chosen strategically, the knowledge produced could be generalised (Flyvbjerg & Seale, 2007) based on it being a comprehensive examination of a particular phenomenon (Ruddin, 2006). Even if certain produced knowledge cannot be generalised, it does not mean that "it cannot enter into the collective process of knowledge accumulation in a given field or in a society" (Flyvbjerg & Seale, 2007, p. 227). Yin (2011, p. 21) draws attention to the point that "case studies, like experiments, are generalizable to theoretical propositions and not to populations or universes". He argues that in order to avoid making false generalisations, the contexts within which people act should be recognised as social constructions, not physical locations.

Consequently, a case study methodology is adopted in this thesis regarding its research objectives, i.e. to develop a better understanding of the hydropower boom. Realising this objective could only be possible through a contextual, in-depth and thorough examination of the hydropower boom in BiH. In order to do this, in addition to using both qualitative and quantitative social science data collection methods (see Section 4.2), I explored the case from different angles: (1) statistically, (2) geographically, and (3) administratively (Figure 1-9). Accordingly, Chapter I reviews the literature on the global hydropower boom; Chapter II presents primary data on the hydropower projects in BiH while comparing it with the secondary data from other countries in South-East Europe and the rest of the world; Chapter III shifts the focus to small/mini on-paper hydropower projects in the country; and Chapter IV presents primary data from the Martin Brod village, where there are two (one small and one large) on-paper hydropower projects. Chapter IV also presents evidence of how sustainability imaginaries are understood differently at different scales and times. Different administrative levels in the country were thus researched beginning at the local level in Martin Brod and continuing upwards through the Bihać municipality, Una-Sana Canton, FBiH entity (as well as RS when necessary), and the BiH state in which the village is located. Doing this provided an in-depth understanding of the case as I approached it from different scales and various angles.

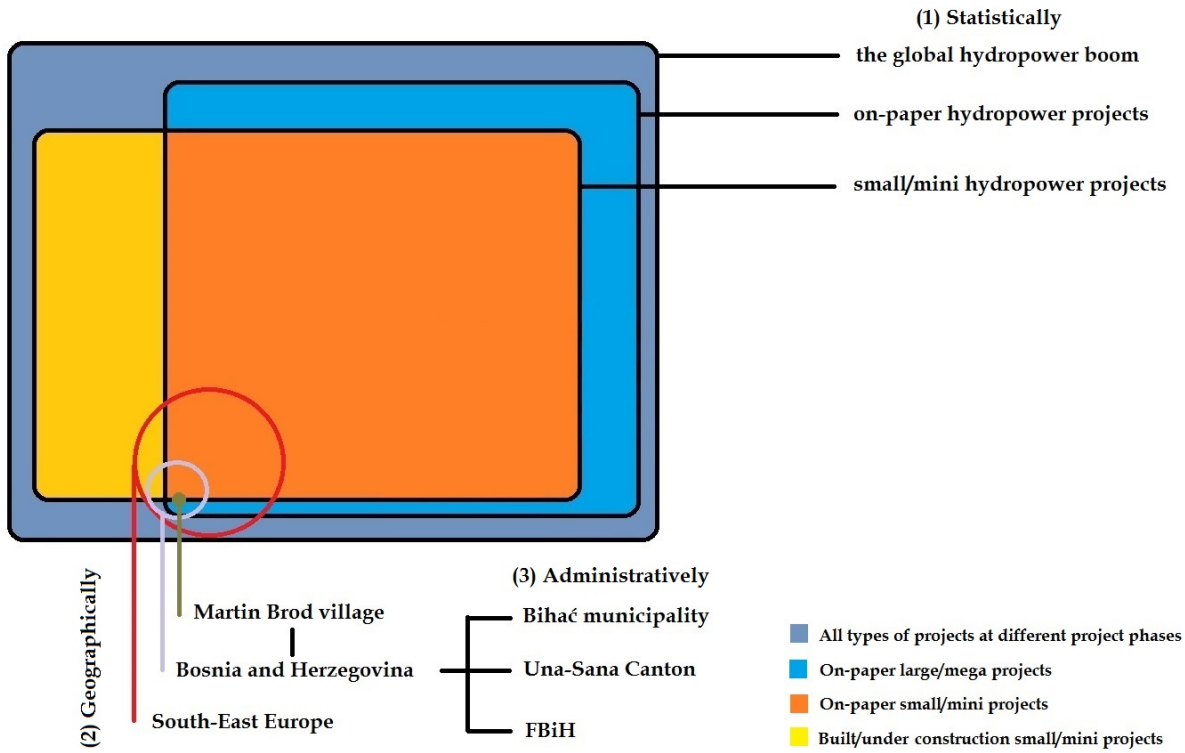

Figure 1-9 Angles used for this study

4.2. Fieldwork and methods

The empirical research was conducted in the Martin Brod village and in Bihać, Banja Luka, Sarajevo, and Mostar. The fieldwork took place over two periods between July and October 2016 (Period I) and July and August 2017 (Period II). In total, approximately five months were spent in the field.

A combination of qualitative and quantitative research methods were used during the fieldwork. This allowed me to apply any methodological tool necessary to answer the research questions and to take an approach that is neither solely positivist (quantitative approach) nor constructivist (qualitative approach) (Teddlie & Tashakkori, 2008). Quantitative methods, such as household surveys, can support this with statistical data collection to describe population attributes and behaviours (Teddlie & Tashakkori, 2008). Qualitative methods can help with the exploration of complex and sensitive issues as well as capture the ways and voices of people (Rabionet, 2011). A combination of necessary quantitative and qualitative methods, i.e. semi-structured interviews and informal talks, household surveys, and participant observation were found useful for this study.

The village was chosen because plans to build a large hydropower plant there have been in place for more than 50 years and plans to build a small hydropower plant for about 10 years. Data was collected for both small and large hydropower plant plans at the national level. This was done in order to obtain an overview of the hydropower business in the country as there are many legal and practical overlaps in terms of small and large hydropower plant investments.

As the two entities (FBiH and RS) have independent energy policies, I focused on FBiH. This is because FBiH has greater administrative complexity due to being divided into 10 semi-autonomous cantons and I found focusing on FBiH more beneficial for grasping the picture at

the national level. Where necessary, to understand the country context, interviews were conducted with officers and civil society organisations in RS as well.

4.2.1. Pilot study

A pilot study was applied prior to the fieldwork in order to refine research methods and questions and prepare better for fieldwork. This included finding accommodation, an interpreter and other practical information (Sampson, 2004). Despite the ongoing debate about the usefulness of a pilot study in qualitative research – i.e. the view that pilot studies might not be necessary as data collection methods and data analysis strategies could also be developed during the fieldwork (Williams-McBean, 2019) – the pilot study was advantageous for me also because it allowed me to identify some possible challenges, collect the necessary information to design the household survey, and identify potential strategies to establish a rapport with subjects.

During the pilot study, which was one week, I attended a local renewable energy conference in the city of Bihać that was organised by domestic investors. At the conference, I had a chance to speak with both domestic and international renewable energy investors and to local decision-makers. In addition, I visited two villages, i.e. Kulen Vakuf and Martin Brod, which were major locations of the anti-dam protests against the large hydropower project to be built on Unac River. I chose Martin Brod as my starting point because it was the centre of protests and a project site for planned hydropower projects. I had informal talks with locals from both places. A local tourist guide and activist, who was known by many people in these two villages, accompanied me during the pilot study visits.

4.2.2. Establishing rapport

Establishing rapport enhances the quality of interaction between interviewer and subject of study (Collins, Lincoln, & Frank, 2002). Qualitative research, to a great extent, relies on building good interpersonal relations between researcher and subject (Guillemin & Heggen, 2009). Establishing a rapport in a Serbian village for a researcher with a Turkish Muslim origin, however, was not experienced to be a significant problem. This is mainly due to two reasons. First, my first field assistant was a Serbian citizen, and this helped inhabitants, who were mostly Serbian, to relatively easily find commonalities and establish a connection with her (directly) and me (indirectly). Second, the inhabitants were very open to being a part of a scientific study as, according to them, Martin Brod had always deserved more scientific attention due to its natural value and history, hence, they were glad to be a subject of study. The interviews during the second period of the fieldwork were conducted mainly with Bosniaks and in institutions and other public offices governed by Bosniak authorities. Having an assistant then with a Bosniak background (my second assistant) helped me to establish a rapport during the second period of the research.

4.2.3. Participant observation and informal talks

Participant observation is a common form of qualitative research (Winchester & Rofe, 2000) in terms of collecting good data as it "involves immersing yourself in a culture and learning to remove yourself every day from that immersion so you can intellectualise what you have seen and heard, put it into perspective, and write about it convincingly" (Bernard, 2002, p. 324). Participant observation can take a range of forms from overt to covert according to the position

of the researcher to the subject of research (Hammersley & Atkinson, 2007). It allows the researcher to develop meaningful relationships between these two sides, i.e. researcher and subject, thus facilitating a deep understanding of the research context (Eyles, 1988; Hammersley & Atkinson, 2007).

Therefore, I chose participant observation as a method during my stay in the Martin Brod village. Doing so helped me to comprehend the contextual settings better. Understanding these relationships enabled me to identify people's perception of decision-making mechanism and their role in giving direction to their lives in the past, present moment, and potentially in the future. Participant observations took place in distinctive settings such as village gatherings - e.g. the village festival and a political party's meeting, random visits to inhabitants' houses at different times of the day, joining collective social activities in and outside of the village, regular visits to *kafanas* (the local name for a mix of café, restaurant, bar) during the day, and having traditional evening walks to meet and chat with neighbours in and around the village.

I was overt in terms of my identity yet slightly covert about my exact research topic due to the nature of the topic itself. By doing this, I tried to avoid any biased or influenced opinion among the inhabitants about the two planned hydropower projects (Lugosi, 2006). However, I always introduced myself as a researcher interested in Martin Brod and the Una National Park.

Informal talks are natural components of participant observation (Musante & DeWalt, 2010). For this, a large number and variety of people were engaged in conversations, including permanent and summer residents, rangers, tourists, tourist guides, fly fishers, and food suppliers of the village. In addition, informal talks were a good way of gathering data, especially during the second part of the fieldwork where the sensitive topic of corruption was covered. While describing the details of their corruption stories, most of the respondents did not allow me to take notes, which meant that I had to note the stories down carefully afterwards.

4.2.4. Semi-structured interviews

Semi-structured interviews are preferred when the aim is to cover a general script and certain topics in an open yet somewhat systematic way (Bernard, 2002) as they "unfold in a conversational manner offering participants the chance to explore issues they feel important" (Longhurst, 2016, p. 143). Semi-structured interviews are also a good approach when there might not be a second chance to interview someone, as in the case of high-level bureaucrats or public officers (Bernard, 2002). Semi-structured interviews are very suitable for case studies and other small scale studies due to being a very flexible research method (Drever, 1995)

I conducted a total of 65 semi-structured interviews with 73 participants. 30 of these interviews were conducted with inhabitants of Martin Brod while 35 were conducted with bureaucrats, decision-makers, concession commission heads, hydropower sector experts, donors, consultants, investors, and officials at development agencies, water agencies, international financial institutions, hydropower associations and civil society organisations (Appendix 1). The semi-structured interview guideline can be found in Appendix 2.

Most of the interviews took between one to two hours and were conducted in Bosnian, Serbian or Croatian except for eight which were conducted in English. Most interviews were recorded on a voice recorder with the permission of respondents while the rest were written down carefully during and/or immediately after.

4.2.5. Household survey

Survey research is one of the most commonly applied quantitative social science methods and is a form of structured interviewing. In the survey, respondents are exposed to the same questions in the same order (Bernard, 2002; Dunn, 2010). They usually involve both qualitative and quantitative data "in relation to matters as varied as environment, social identity, […] quality of life and community, work and social networks" (McGuirk & O'Neill, 2010, p. 192). While a survey by itself might have some disadvantages in terms of the quality of data collected, when it is complemented by qualitative data, it could provide an in-depth perspective on social contexts (McGuirk & O'Neill, 2010).

To support qualitative research methods, a household survey was conducted in Martin Brod during the first period of the fieldwork. This was done in order to create a better understanding of the socio-economic profile of the village. The survey was applied only to the permanent residents of Martin Brod and provided almost a full coverage of the permanent population. The statistical data was useful to understand the demographic and socio-economic profile of the Martin Brod village. The household survey questions can be found in Appendix 3.

4.2.6. Secondary sources

Secondary data, such as statistics, some project details, plans, regulations and laws, etc., were collected from official statistics, technical reports, government documents, civil society reports, historical documents, EU policy documents, the BiH state, entity level and cantonal policies, newspaper articles, personal communications, the local library of Bihać, and websites related to the hydropower sector. Data in Bosnian/Serbian/Croatian was translated into English by the two field assistants.

4.2.7. Data analysis

Qualitative data analysis requires classification and interpretation of textual and multimedia material "to make statements about implicit and explicit dimensions and structures of meaning-making in the material and what is represented in it" (Flick, 2014, p. 5). Qualitative data analysis can take three different approaches: (i) focusing on subjective experiences, (ii) describing the making of the social situation, and (iii) going into spheres of implicit and unconscious aspects of a social phenomenon (Flick, 2014). Analysing qualitative data, incorporates using an array of tools such as meme writing, coding, and making diagrams (Mihas, 2019). To Miles and Huberman (1994, p. 1), good qualitative data analysis is likely to lead serendipitous findings which help researchers to "get beyond initial conceptions and to generate and revise conceptual frameworks".

The analysis of the qualitative data was done using MAXQDA 2018, which allows the systematisation, organisation, and analysis of non-numeric data in order that connections between different components and aspects of the data collected can be made (Flick, 2014). Axial coding, i.e. linking categories of codes, was accomplished using this software. As a result, themes, patterns, and relationships between codes were identified. The analytical induction method – namely classifying word and phrase repetitions and, based on this, developing hypotheses – was used for the analysis of the qualitative data. These hypotheses were subsequently checked with informants in the field (Emerson, 1988). Triangulating the data in

this way provided new insights that were checked in further interviews and in informal conversations with people encountered during the fieldwork.

The quantitative data were analysed using IBM SPSS (Statistical Package for the Social Sciences) 22 which enable researchers to more easily score and analyse the data in various ways (Bryman & Cramer, 2005).

5. Structure of the thesis

This thesis is a compendium of three articles (Chapter II–IV), one introduction (Chapter I) and one synthesis (Chapter V) chapter. The first two articles (Chapter II and III) engage directly with the hydropower boom discussions and have thus empirical and theoretical overlaps. Yet, each of the two articles addresses distinct aspects of the research objectives and contributes to the literature in different ways. While Chapter II questions whether the hydropower boom is going to take place to the extent foreseen, Chapter III draws attention to overlooked corruption cases in the hydropower sector which are a result of, and maybe a reason for, the hydropower boom. The last article uses hydropower development and ecotourism as two examples of unsuccessful sustainable development projects in order to contribute to the sustainability literature. It shows that determining the sustainability concept limits opportunities for potential misuse but also for those who do not normally have a voice in the political arena to be empowered. All three articles have been published as individual papers in international peer-reviewed journals. Chapter II has been published in *Renewable and Sustainable Energy Reviews*; Chapter III has been published in *Ecological Economics*, and Chapter IV has been published in *GeoJournal*.

Chapter II: Dogmus, Özge Can and Nielsen, Jonas Østergaard. 2019. "Is the hydropower boom actually taking place? A case study of a South-East European country, Bosnia and Herzegovina," *Renewable and Sustainable Energy Reviews*, Volume 110, pages 278–289

Chapter III: Dogmus, Özge Can and Nielsen, Jonas Østergaard. 2020. "The on-paper hydropower boom: A case study of corruption in the hydropower sector in Bosnia and Herzegovina," *Ecological Economics, Volume 172, 106603*

Chapter IV: Dogmus, Özge Can and Nielsen, Jonas Østergaard. 2020. "Defining sustainability? Insights from a small village in Bosnia and Herzegovina," *GeoJournal*

Chapter 2 - Is the hydropower boom actually taking place? A case study of a South East European country, Bosnia and Herzegovina

Renewable and Sustainable Energy Reviews, 2019, Volume 110, Pages 278-289

Özge Can Dogmus and Jonas Østergaard Nielsen

(Una River, Elektroprojekt Sarajevo (1959))

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Abstract

Over the last two decades, the world has experienced a boom in the number of hydropower projects. Considered an important part of sustainable development, particularly in post-socialist transition and developing countries, it is claimed that hydropower plants will make substantial contributions to environmentally friendly economic growth and poverty eradication. However, the so-called 'hydropower boom' has not resulted in a global mass construction of plants. In general, over-ambitious planning, a lack of funding opportunities and corruption are often put forward as explanations for the discrepancy between the number of plans and actual construction of hydropower plants. In this paper, it is added to these three reasons, illustrating with a case study from Bosnia and Herzegovina, where the planning of hydropower projects very rarely results in their construction. The results are based on secondary data and primary data, i.e. semi-structured interviews and informal talks, collected during fieldwork in Bosnia and Herzegovina. The data was analysed using the analytical induction method. The results highlight how administrative complexity, over-estimations of exploitable capacity, an unattractive socio-political and socio-economic situation and how these factors in combination create the conditions for various practices of corruption hinder the construction of plants. Comparing the results with other findings from around the world, the paper suggests approaching the so-called global hydropower boom with caution.

1. Introduction

Over the last two decades, the world has experienced a boom in hydropower plants plans. It is expected that unharnessed hydropower can contribute to economic growth, reduction of poverty, flood control, water supply, and low-cost energy generation in an environmentally friendly manner (Frey & Linke, 2002; Hartmann, Harrison, Opperman, & Gill, 2013; IHA, 2018b; UNIDO & ICSHP, 2016a; World Energy Council, 2016). Consequently, hydropower has become an important part of many sustainable development strategies particularly in post-socialist transition and developing countries (Ansar et al., 2014; Botelho, Ferreira, Lima, Pinto, & Sousa, 2017; IHA, 2018b; Siciliano & Urban, 2017; Zarfl et al., 2015). In Bosnia and Herzegovina (hereafter BiH, derived from Bosnia i Hercegovina), the European Union (EU) has taken a strong initiative by creating frameworks to develop the country's energy sector, giving high importance to hydropower projects (European Commission, 2017b; IHA, 2018b). Accordingly, the number of hydropower projects has increased in BiH (Erlewein, 2013; Kelly-Richards et al., 2017; Matthews, 2012; Merme, Ahlers, & Gupta, 2014; Zarfl et al., 2015). This is especially true for small hydropower projects. These are expected to be cheaper to construct, maintain and run, and have smaller negative environmental impacts compared to large hydropower projects (Manzano-Agugliaro et al., 2017; Nautiyal, Singal, Varun, & Sharma, 2011), yet large plants remain attractive for a number of investors in the country (Helston & Farris, 2016; ICOLD, 2019). Currently, 296 hydropower plants, both small and large, are planned for construction in the country (Riverwatch & EuroNatur, 2018a). In this paper, all types of hydropower projects, including small and large, are lumped up together.

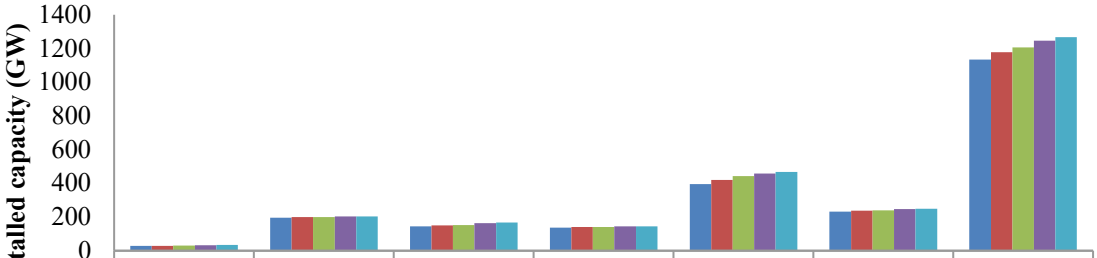
Up until now, these plans have not resulted to any significant extent in the actual construction of hydropower plants in BiH. Over-ambitious planning, lack of funding opportunities, and prevalent corruption have been mentioned separately as significant reasons globally, including for the South East Europe (SEE) region where BiH is located, why many projects remain on paper (Chattopadhyay, Nikolakakis, Malovic, & Väyrynen, 2017; Haas, 2008; Lehner et al., 2005; Oud, 2002). Negative impacts of particularly large hydropower plants such as habitat deterioration, population displacement, loss of cultural heritage, loss of water resources and fish stock, reduction of access to livelihood opportunities, water grabbing, and increasing public health vulnerability also may play a role (Ahlers, Budds, Joshi, Merme, & Zwarteveen, 2015; Baskaya, Baskaya, & Sari, 2011; Botelho et al., 2017; Cernea, 1997, 2004; Fung, Pomun, Charles, & Kirchherr, 2018; Gleick, 1992; Kibler & Tullos, 2013; Koç, 2014; Kumar Sharma & Thakur, 2017; Matthews, 2012; Merme et al., 2014; Polimeni, Iorgulescu, & Chandrasekara, 2014; Räsänen, Koponen, Lauri, & Kummu, 2012; Roberts, 1995; Siciliano & Urban, 2017; Yu & Xu, 2016). In this paper, it is added to these insights by highlighting some further obstacles regarding the construction of all types of hydropower plants in Bosnia and Herzegovina. Focus will be on over-ambitious planning, the lack of funding opportunities, and widespread vulnerability to corruption in the hydropower sector in BiH.

The paper is structured as follows. First, a review of the global hydropower boom and how it takes form in BiH is presented. Then, the methods used, i.e. how the country-level in-depth information was collected and analysed, are explained. Following this, our insights from the hydropower sector in BiH are presented. In that section, results are supported by literature. Subsequently, the results are used to discuss whether an actual hydropower boom at the global level can be expected. A conclusion wraps up the paper.

2. Hydropower development in the world

Climate change concerns have become the catalyst for the increasing number of renewable energy investments worldwide over the last half-century. Among renewable energy types, hydropower is the largest global generator of electricity (IEA, 2016). Hydropower plants are expected to provide advantages like flood control, poverty eradication, and economic growth (IEA, 2000; Manzano-Agugliaro et al., 2017; Panić, Urošev, Milanović Pešić, Brankov, & Bjeljac, 2013). As such, hydropower has become an important part of many sustainable development strategies, particularly in post-socialist transition and developing countries like BiH (Merme et al., 2014; Panić et al., 2013; Zarfl et al., 2015). The so-called global hydropower boom has been the result (Zarfl et al., 2015).

Although a significant number of scholars caution against the anticipated social and environmental impacts of hydropower projects (Ahlers et al., 2015; Baskaya et al., 2011; Botelho et al., 2017; Cernea, 1997, 2004; Fung et al., 2018; Gleick, 1992; Kibler & Tullos, 2013; Koç, 2014; Kumar Sharma & Thakur, 2017; Matthews, 2012; Merme et al., 2014; Polimeni et al., 2014; Räsänen et al., 2012; Roberts, 1995; Siciliano & Urban, 2017; Yu & Xu, 2016), the global installed hydropower capacity is increasing slowly (Figure 2-1). This increase is supported by the World Bank Group (World Bank, 2017c) and other international development associations like the European Investment Bank (EIB, 2018; GIZ, 2014). The most rapid advancement of the total installed capacity has been in East Asian and Pacific countries followed by South American countries. But the actual global spatial distribution of planned and constructed projects is unclear (Zarfl et al., 2015).



	Africa	North America	South America	South and Central Asia	East Asia and Pacific	Europe	TOTAL
2013	28.7	195.1	145	137.7	396.2	231.9	1134.6
2014	29.4	198.8	150.1	140.8	420.9	238.2	1178.2
2015	30.1	199.9	153	140.9	443.2	240	1207.1
2016	33.2	202.5	163	144.3	457.5	246.3	1246.8
2017	35.3	203.1	167	144.7	468.3	248.6	1267

Figure 2-1 Increase in the global installed hydropower capacity[1] from 2013 to 2017[2]

Small hydropower plants[3] are attractive because of their "low administrative, executive costs, and short construction time compared to large power plants" (Manzano-Agugliaro et al., 2017, p. 477). Despite the fact that a diversion facility is often required for small hydropower plants,

[1] 1 petawatt (PW) = 10^6 gigawatt (GW) = 10^9 megawatt (MW) = 10^{12} kilowatt (KW)
[2] IHA (2017b)
[3] There is no global consensus on the categorization of hydropower projects depending on their sizes. Most of the countries consider projects with less than 10 MW of installed capacity as small hydropower [12]. This general trend is what we embrace in this paper as well.

there is no need for building reservoirs (i.e. dams) which is the main reason why they are attractive compared to larger plants (Kibler & Tullos, 2013). By 2017 in SEE, for example, 87% of the existing projects and almost 91% of the planned ones were with less than 10 MW installed capacity, i.e. small hydropower plants (Riverwatch & EuroNatur, 2018a). Zarfl et al. (2015) show the capacity distribution of the global hydropower boom. Although their data excludes projects with less than 1 MW of installed capacity and those that are not officially registered, they managed accessing the capacity data of 3,490 hydropower plant plans worldwide. Their study finds that the installed capacity of 1,290 projects is between 1-10 MW; 1,388 projects is > 10-100 MW; 659 projects is > 100-1,000 MW; and 153 projects is > 1,000 MW. In other words, by 2014, small hydropower projects constituted at least 37% of the global hydropower boom (Zarfl et al., 2015).

Zarfl et al. (2015) also show that the hydropower boom is concentrated in transition and developing countries including BiH with "high but not yet exploited hydropower potentials" (Lehner et al., 2005). By 2017, in many of these countries, the number of projects that are being implemented was, however, far behind the total number of planned hydropower projects (for some examples, see (Alam et al., 2017; CBS, 2017; Chattopadhyay et al., 2017; Riverwatch & EuroNatur, 2018a)). For example, by 2017, only 9% of the projects were under construction in countries in SEE with a percentage of 3.5% and 6% for Serbia and BiH respectively (Figure 2-2).

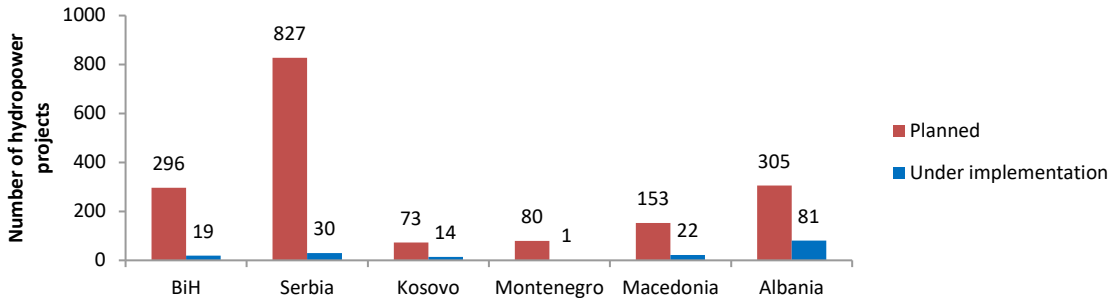


Figure 2-2 The planned and under construction hydropower projects in transition countries in SEE by 2017[4]

3. Hydropower projects in Bosnia and Herzegovina

BiH is one of the former republics of the Socialist Federal Republic of Yugoslavia (1945-92, hereafter Yugoslavia). After the Bosnian War (1992-95) that took place between three dominating ethnicities in the country, namely Bosniaks, Serbs, and Croats, BiH was established as an independent country in 1995 based on the externally enforced Dayton Peace Agreement (hereafter Dayton). Dayton divided the country into two main autonomous entities (Republika Srpska [RS] and the Federation of BiH [FBiH]) and one autonomous district (Brčko). In addition, FBiH was divided into ten autonomous cantons (Figure 2-3). In 2016, the total population of the country was 3.5 million and the population density was 68.7 people per km2 (World Bank, 2016). In the same year, the World Bank announced a population growth of -

[4] Source: Riverwatch & EuroNatur (2018a)

0.5% for the country (2016). In 2017, the official registered unemployment rate was 25.8% (World Bank, 2017e).

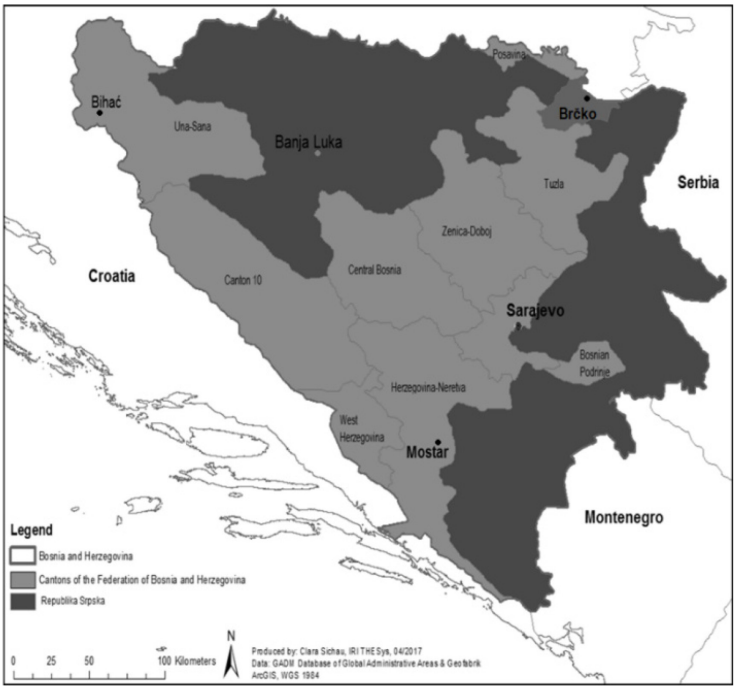


Figure 2-3 The administrative map of BiH[5]

After the Bosnian War, the country's GDP declined by about 20% leaving it highly dependent on foreign aid (Pugh, 2002; Stroschein, 2013). In the early 2000s, the World Bank and the EU suggested a transition to a market-oriented economy (Pugh, 2005). The aim was for the country to be able to generate sustainable growth (EU, 2018; World Bank, 2001, 2002, 2017b). The BiH government, in response, revised existing laws and introduced a wide range of new laws aimed at achieving the desired market reforms and that focused on the privatization of public enterprises and assets (Tzifakis & Tsardanidis, 2006). To do this, renewable energy generation, such as hydropower, wind and solar power, were identified as a promising sector for attracting private investors (BiH, 2011). Due to the lack of state support, in comparison to hydropower, wind and solar power have had slower progress so far.

Since the time of Yugoslavia, hydropower electricity generation has been important in the country (Suica, 1971). In 1968, for example, hydroelectricity made up half of all generated electricity in Yugoslavia, and this was only one fifth of the then estimated potential (Antonshin, 1974). In 2015, hydropower made up more than half of the total installed power capacity in BiH (IRENA, 2017). Currently, there are 76 hydropower plants in BiH: 28 of them have less than 1 MW, 34 of them between 1-10 MW, 3 of them are between 10-50 MW, and 11 of them are more than 50 MW capacity (Riverwatch & EuroNatur, 2018a). The total technical potential of the country is 6110 MW (IRENA, 2017), 27% of which is exploited (IHA, 2016b).

This large potential and the country's familiarity with the sector have led the World Bank and the EU to recommend local decision-makers to pursue the development of hydropower as one

[5] Prepared by Clara Sichau

major sustainable development strategy in BiH (Chattopadhyay et al., 2017; EU, 2017). As a consequence, approximately 300 private hydropower plants had been planned by 2017 – up from 165 in 2015 (BankWatch & EuroNatur, 2018; Riverwatch & EuroNatur, 2015, 2018a)(Figure 2-4). 81 of them are less than 1 MW; 170 of them between 1-10 MW; 49 of them are between 10-50 MW; and 15 of them are more than 50 MW installed capacity (Riverwatch & EuroNatur, 2018a). Nevertheless, in 2015, only around 8% of the 165 total planned projects were under construction while 14% of them remained in unclear or unknown status (Riverwatch & EuroNatur, 2015). In 2016, the situation was not much different as the majority of the projects did not show any significant progress in terms of their construction (Muharemovic, 2016)[6].

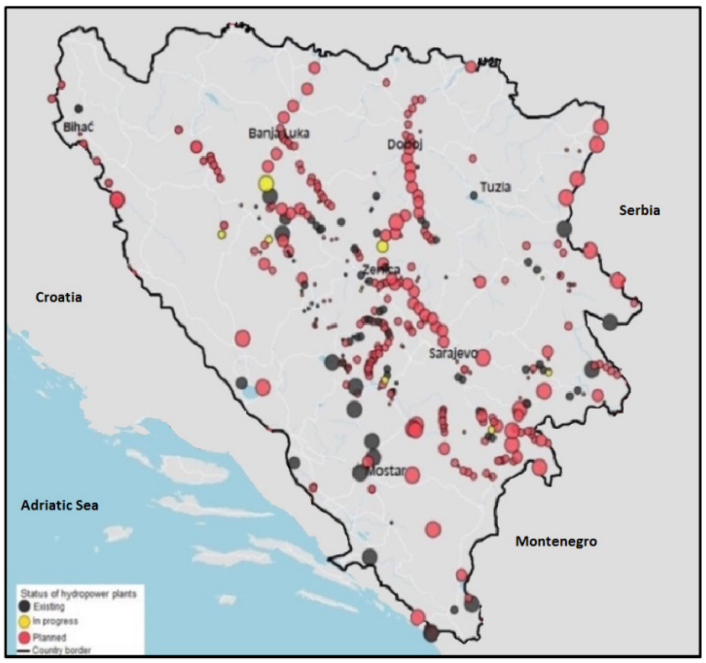


Figure 2-4 Spatial distribution of the hydropower plants and projects in BiH in 2017[7]

This slow progress is closely related to the absence of consistent development strategies for the sector associated with a large bureaucracy, a lack of necessary legal documents and clearances, and the generally poor social, political and economic environment for investments at the country level (Dolecek & Karabegovic, 2013; Karakosta et al., 2012; Lalic et al., 2011). The hydropower sector in BiH is highly bureaucratic as, according to the BiH Constitution (as defined in Dayton), the competences over water-management reside with the semi-autonomous units of FBiH, RS, the Brćko district as well as the state of BiH and therefore independent of each other (FBiH, 2012). The responsibilities regarding hydropower investments provide another example. This is, in FBiH, distributed among 79 municipalities, 30 cantonal ministries, 12 concession commissions and three federal ministries (the Ministry of Energy, Mining and Industry, the Ministry of Environment and Tourism, and the Ministry of Agriculture, Water Management and Forestry). In addition, two water agencies, the Water Agency of Sava River and the Water Agency of Adriatic Sea, are involved in administrative procedure concerning the construction of hydropower plants, especially those on big watercourses. In FBiH, one hydropower project can therefore involve at least 10 legal actors in the administrative procedure

[6] These numbers are attached with some uncertainty however as there is no state-level official registry of the planned projects.
[7] Source: Adapted from RiverWatch & EuroNatur (2018b)

from planning to the operational stage (FBiH, 2012). In Norway, by comparison, only five legal actors are involved in the same procedure (IHA, 2017d; UBP Inc., 2015). Yet, the so-called hydropower bureaucracy is only one of the reasons behind this slow progress towards materialization of the projects as it shall be seen in Section 5.

4. Methods

The research was conducted in BiH and mainly in the locations of Bihać, Banja Luka, Sarajevo, and Mostar. The research was conducted by the first author over two periods between July and October 2016 (Period I) and July and August 2017 (Period II). In total, approximately five months were spent in the field. It is a case study. As such, it is a contextual, in-depth and thorough examination of a subject of study (the case) and its contextual conditions (Flyvbjerg & Seale, 2007; Yin, 2014).

For this study, qualitative research methods were applied. Qualitative methods can help exploring complex and sensitive issues as well as capturing the ways and voices of people (Rabionet, 2011). A total of 65 semi-structured interviews were conducted. A detailed list of the interviewees and the guide for semi-structured interviews can be found in Appendix-1 and Appendix-2 respectively. 35 out of the 65 interviews were conducted with bureaucrats, decision-makers, concession commission heads, hydropower sector experts, donors, consultants, investors, and officials at development agencies, water agencies, international financial institutions, hydropower associations and civil society organizations. The remaining 30 were conducted with locals in the small village Martin Brod located in the Una National Park where the first author lived for the majority of the five months spent in BiH. The village was chosen because plans to build a large hydropower plant there have been in place for more than 50 years and plans to build a small hydropower plant for about 10 years. These projects remain on paper. No differentiation has been made between small and large hydropower plants when the data was collected. This was to get an overview of the hydropower business in the country as there are many legal and practical overlaps in terms of small and large hydropower investments. The majority of the interviews were conducted in Bosnian, Serbian or Croatian with the exception of eight which were conducted in English. The large part of the interviews took between one and two hours with the assistance of two translators. The majority of interviews were recorded by a voice recorder while the rest were written down carefully during and/or immediately after the interviews.

The data was analysed using a qualitative data analysis software named MAXQDA 2018 which allows systematizing, organizing, and analysing non-numeric data, such as semi-structured interviews, in order to make connections between different components and aspects of data collected (Flick, 2014). Axial coding, namely making interconnections between categories of codes and linking them, was done using this software. In this way, themes, patterns, and relationships were identified. The analytical induction method was used for the analysis of the primary data. For which, first, word and phrase repetitions were classified, later, through summarizing the data, hypotheses were developed. These were subsequently checked against the primary data as well as with informants, such as decision-makers and policy-makers, in the field (Emerson, 1988). Triangulating the data in this way validated our hypothesis as well as providing new insights that were checked in further interviews and in informal conversations with people encountered during the fieldwork.

In addition to the qualitative data, secondary data were collected from official statistics, technical reports, government documents, civil society reports, historical documents, EU policies, the BiH state, entity level and cantonal policies, newspaper articles, personal communications, and hydropower sector-related websites. Some of the official documents were collected from the state entities and cantonal offices personally, some were accessed online. Some statistics were also accessed online and through civil society organizations and development agencies present in the country. The secondary data was likewise analysed based on the analytical induction method and using MAXQDA 2018.

It is important to highlight the limitations related to the secondary data. Since there is no central registry at the country level, the hydropower project statistics used in this study are mostly based on databases that were prepared by researchers who collaborated with civil society organizations and international development agencies.

5. Insights from the hydropower development in Bosnia and Herzegovina

There are many reasons why there has been relatively slow progress in terms of the construction of hydropower plants in BiH and the other transition countries in SEE. Generally speaking, however, this situation is due to a set of common features. In this section it is focus on the three most important among these: (i) over-ambitious planning that leads to plans being rejected once the actual sites have been surveyed more carefully (Oud, 2002), (ii) a lack of funding opportunities that hinders the actual construction of planned hydropower plants (Lehner et al., 2005), and/or (iii) widespread vulnerability to corruption that results in projects being revoked or remaining on paper for many years (Haas, 2008).

5.1. Over-ambitious planning

According to the results of the fieldwork, there are two major reasons for over-ambitious planning in BiH. The first is the common mistake of confusing the exploitable hydropower potential with other types of potentials. This results in misleading overall assessments of the exploitable hydropower potential of a given country or river. This is an issue for many transition countries, especially those in SEE (see, for instance, (IRENA, 2017)). As identified especially during the secondary data analysis, a major reason for this confusion is the ambiguous use of the term ‘hydropower potential’ in both academic and policy literature. The confusion is perhaps not surprising as there are four types of hydropower potentials, namely gross, technical, economic, and exploitable. The gross potential is used to define all natural runoffs at all locations that are potentially available for hydropower exploitation. The potential that could be harnessed under current technology is the technical one. The cost competitiveness of the technical potential compared to other energy sources is the economic potential. And finally, the exploitable potential is calculated by taking into account environmental, social, economic and other restrictions (Lehner et al., 2005). To illustrate, by 2015, global gross, technical, economic, and exploitable hydropower potentials were 128, 26, 21, and 16 PW/hours per year respectively (Zhou et al., 2015). In other words, the global exploitable potential was only 12.5% of the global gross potential (Figure 2-5). The global developed hydropower potential in 2015 was 24% of the global exploitable potential and 3% of the global gross potential (IHA, 2016a).

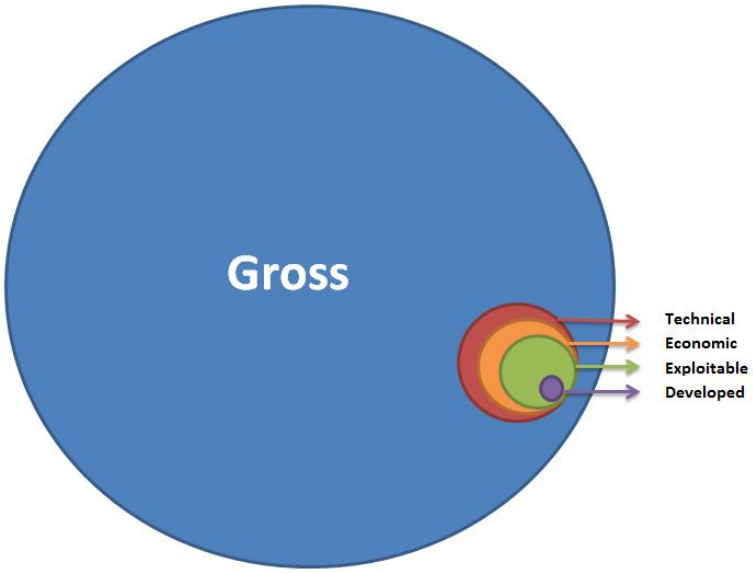


Figure 2-5 The proportional comparison of the different categories of global hydropower potential in 2015[8]

Mistaking the different potentials with each other when making hydropower development plans is a common problem in almost every hydropower sector document covering the SEE reviewed. For example, according to the International Renewable Energy Agency (IRENA), only the economic or the technical potential was taken into account when estimating the hydropower potentials of SEE countries (IRENA, 2017). In other words, IRENA did not take into account the environmental and social factors related to the construction of a plant (Nelson, 2015). Often it is not even mentioned which hydropower potential category was used for an assessment. During the interviews, the benefits of hydropower development in BiH were mentioned 65 times yet none of the respondents clearly mentioned the exploitable potential of the hydropower sources in the country. When some experts, for instance, in the Ministry of Energy, Mining and Industry, mentioned the technical potential, they also acknowledged the lack of updated studies and the federal level spatial plan. In the BiH Energy Sector Study Final Report, dated 2008, the total hydropower potential of the country was, for example, calculated as 7.3 GW without clarifying which hydropower potential was considered for the energy sector assessments (Granić et al., 2008). Unfortunately, during the analysis of the results, particularly of the documents and the expert interviews, it was identified that other potential categories were often mixed up with the exploitable potential, which is almost always smaller than the others. Having a rich technical hydropower potential, for instance, does not immediately equate with having a rich exploitable potential. Due to this mistake, the scopes of planning and assessment expand without being necessarily related to the reality on the ground. In BiH, the construction of 500 MW more hydropower capacity is envisioned by 2050 (BiH, 2016b). Nevertheless, it is unclear whether this plan is actually based on the exploitable potential. Based on the research findings, not clarifying which potential and/or how the potentials relate to each other could potentially indicate large over-estimations of the actual hydropower potential in BiH.

The second reason behind over-ambitious planning, as both primary and secondary data indicate, is related to the administrative complexities and the lack of communication between different administrative planning units found in BiH. A point also mentioned in Section 3. The

[8] Prepared based on data from (IHA, 2016b; Zhou et al., 2015)

administrative complexity was mentioned by the respondents in every interview conducted (except with the locals of Martin Brod village). The number of times regulations, procedures and responsibilities were mentioned in the interviews was 152, with 85 of these mentions pivoted around a lack of understanding of the procedures of concession obtaining and/or granting in the sector. A main consequence of this lack of understanding was, according to the respondents, unregulated planning. Each unit is in fact making autonomous hydropower plans independent from what other units are making (RES LEGAL Europe, 2019). For example, FBiH and RS have independent energy policies and do not share their hydropower plans with each other (RES LEGAL Europe, 2019). In addition, in FBiH, there is no up-to-date spatial plan at the federal level (Korjenić, 2015; Ministry of Foreign Trade and Economic Relations of BiH & USAID, 2015). In fact, the one currently being used is from the time of Yugoslavia. The public officers interviewed complained that although an update was proposed to the federal parliament in 2002, due to the on-going and unresolved conflicts of interests of different administrative units, the proposal is still under revision. The result of this is that there is no central registry and 11 different concession commissions in FBiH acting independently from each other (Ministry of Foreign Trade and Economic Relations of BiH & USAID, 2015). An overall cumulative assessment of those projects, and how each might relate, infringe, restrict or even prohibit the others, is consequently lacking. This means that, as the analysis shows, when a proper assessment of the feasibility of a planned project is carried out, it is often found that the project is in fact not feasible or, if feasible, it might make other projects that have been planned unfeasible, for example, on the same tributary of a river. As such, the lack of coordination and communication between planning, investigating, and concession granting units results in over-ambitious planning and a subsequently unrealistic high number of project plans.

5.2. Lack of funding opportunities

From the beginning of the 1990s onwards, the transition from the public to the private sector has emerged as a central characteristic of the electricity industry worldwide (Briscoe, 1999). This is also the case in BiH (Jenko, 2007; Salimović, 1999). In general, and in BiH, privatization poses a fundamental challenge to the hydropower sector (Haas, 2008). The major reason for this is that the sector carries large financial risks mostly due to changes in precipitation and runoff (Alavian et al., 2009). These risks are more likely to be taken on by the public rather than the private sector as the latter is more risk averse (Martimort, 2006). This is also due to increasing project budgets as a result of broadening environmental and social mitigation measures the electricity market have to implement (Merme et al., 2014; Moore, Dore, & Gyawali, 2010). In addition, a large and complex mix of deregulation laws and processes means that hydropower investments are long-term, since these laws and processes tend to increase the project implementation period (Briscoe, 1999). As a more general result, hydropower projects have become riskier than before and less attractive for funding (Briscoe, 1999; Tang, Li, & Tu, 2018). There are also other financial risks affecting the availability of funding for new plants in BiH. Next to the unpredictable outputs due to changing river flows, chief among these are long construction periods, capital-intensive project implementations, and complex concession processes (Head, 2000).

In order to attract both foreign and domestic investors needed to turn plans into reality, the BiH state has deregulated the terms of renewable energy trade and decision-making over water resource management while at the same time providing various financial guarantees to potential

investors (Jenko, 2007). For example, fixed feed-in tariffs, which promise less profit to investors and less risk to the state, are replaced by feed-in premiums, which promise more profit to investors and more risk to the state (BiH Foreign Investment Promotion Agency, 2015). This is because, for the fixed feed-in tariff, a fixed price that is independent of fluctuating electricity price is paid to investors. For the feed-in-premium, the payment is strictly tied to the electricity market price. Feed-in premium design, therefore, is expected to boost the competitiveness in the energy market and make the market more attractive to investment (BiH Foreign Investment Promotion Agency, 2015).

These market reforms have contributed to a boom in the number of hydropower plant plans, especially of small ones (Kelly-Richards et al., 2017; Zarfl et al., 2015). Small hydropower plants are generally considered to have less social and environmental impacts than large plants (Cernea, 1997; Fung et al., 2018; Kibler & Tullos, 2013). This is because larger plants require larger investment costs in comparison to small plants and to have larger negative environmental and social impacts (Table 2-1). This leads investors to prefer small hydropower investments (IRENA, 2017). Yet, as stated by an interviewed expert from the IFC, the financing of small size projects is more difficult than the large ones because big multilateral banks do not give loans to small hydropower projects as they do not find these projects profitable enough. Consequently, almost all of the experts, consultants and authorities interviewed highlighted that domestic investors are more dominant in the hydropower market in BiH. This has its own problems. 120 out of 296 planned projects did not have a funding source in 2017 in BiH (BankWatch & EuroNatur, 2018) . According to the interviewed experts, this it is largely because domestic investors lacked the actual capital to turn plans into practice. Thus, for domestic investors, as highlighted by an investor interviewed, finding a source of funding for their projects is a priority and a great challenge that often causes huge delays or the abandonment of plans.

Table 2-1 Hydropower cost-estimations in 2016 in transition countries in SEE [9]

Country	Type	Investment cost [EUR/kilowatts (kW)]	Average operation and management cost [EUR/kW]
Albania	Small	1,150-3,000	40
	Large	2,500-3,800	
BiH	Small	1,400-4,080	40
	Large	1,058-3,700	
Montenegro	Small	1,000-2,778	50
	Large	482-1,900	
Serbia	Small	2,200-2,795	50
	Large	568-3,760	
Republic of North Macedonia	Small	1,200-2,580	50
	Large	1,000-4,154	
SEE countries- average	**Small**	**1,000-8,000**	**50**
	Large	**482-7,773**	

Interviewed experts and investors agree that this situation is also related to the fact that the cost estimations for hydropower investments are still not 'low enough' for domestic investors to implement these projects or for foreign investors to be attracted by low implementation costs. This issue was mentioned 33 times by respondents, mainly by bureaucrats (12), investors (6) and experts (4). The locals interviewed, on the other hand, did not have any opinion about this issue. In 2016, the investment cost of a hydropower plant with 1 MW installed capacity was estimated to be between 1.4 and 4 million EUR in the country (Table 2-1). This amount excludes the costs of environmental and social mitigation measures and of operation and management. Thus, the real cost is expected to be higher. To make a comparison, in the UK the investment cost of a hydropower plant with 1 MW installed capacity is estimated between 2.9 and 4 million EUR in 2018 (Renewable Energy Hub UK, 2018). The estimated cost of constructing a small hydropower plant is thus approximately the same for a developed and a transition country. This, as stated by experts and consultants, creates problems of attracting both domestic and foreign funding for domestic investors as the lack of a clear financial comparative advantage of offering cheap construction discourage many potential foreign investors from investing in the sector in BiH (IRENA, 2017).

Moreover, domestic investors tend to offer "adventurous bids which are financially not viable" (B. Becker & Fischer, 2013). The term 'adventurous bids' is understood as keeping bids at a price that approximates their marginal costs (Sioshansi, 2008). In other words, very little profit and no unforeseeable budget items are included in these bids in order to keep the total budget low. To illustrate, according to the feasibility study prepared in 2014 for the small hydropower

[9] Adapted from IRENA (2017)

project to be constructed in the Martin Brod village, the installed capacity was calculated to be 1.3 MW and the total project budget was estimated to be around 2 million EUR. As mentioned above, 1 MW normally cost 2.9-4 million EUR. This is done to increase the chance of winning the bid. Such bids are very common in electricity markets in general (David & Fushuan, 2000). Almost all of the respondents, including locals, agreed that the prevalence of adventurous bids relies on largely missing investigation of tender application documents due to the complex hydropower bureaucracy and the lack of transparency in the sector. However, the problem arises during the phase of implementation as budget overruns become prevalent (Oud, 2002) resulting in many projects being revoked even before the implementation phase.

5.3. Prevalent corruption

Corruption vulnerabilities is a well-known phenomenon in the hydropower sector across the world (Haas, 2008), especially in countries where there is a general lack of administrative and policy transparency like BiH (Cooley et al., 2014; Hadzialic, 2016; Shandling & Lock, 2008). In the hydropower sector, corruption vulnerabilities take various forms (Jennett, 2007). Table 2-2 shows some of the most common corruption practices (i.e. favouritism, bribing, and nepotism) caused largely by abuse, bad practice, and mismanagement by decision-makers and officials in the hydropower sector. Drawing from interviews conducted, non-transparency, lack of public involvement, improper investigation, receiving bribes and improper documentation are the most frequently faced problems in the sector in BiH. Corruption in the hydropower sector in BiH was mentioned 41 times in total, investors mentioned it 15 times, bureaucrats 14 times, activists 5 times, experts and consultants 3 times, decision-makers 3 times and locals once. Corruption in general in BiH was mentioned 99 times during the interviews and by all respondents interviewed.

Table 2-2 Common forms of corruption vulnerabilities and corruptive acts in the hydropower sector[10]

Project phase	**Project selection/ identification**	**Planning**	**Bidding, evaluation, contracting**	**Construction/ implementation**	**Operation/ rehabilitation**
Problems	A limited number of options are considered	Feasibility studies are done improperly	Non-transparent pre-qualification and bidding procedure	Not fulfilling promises and requirements and bribing officials to avoid project delay penalties	Not fulfilling promises and requirements
	Pre-determination of projects before feasibility studies	Being biased to a particular technology	Accepting improper bidding documents	Biased project supervision	Limited funding of environmental and social mitigation measures
	Limited public involvement	Over- or under design	Bidding selection is not made public and/or not justified	Not taking action against environmental violations	Insurance fraud on equipment and performance guarantees
	Limited influence of project-proponents	Non-transparent environmental and social impact assessment procedure	Deception and collusion	Corruption in processes of resettlement and compensation	Corruption in rehabilitation works

These problems are often connected. To illustrate, non-transparent bidding procedures create a space for bid rigging, whereby the auctioneer, although it is illegal, warns a bidder to either lower or raise his/her bid (Lengwiler & Wolfstetter, 2010). As highlighted by almost all of the interviewed consultants and experts, bid rigging is extremely common in BiH. According to a bidding expert in the hydropower sector in BiH, bid rigging and corruption occurs when a concession-granting official warns a bidder to lower his/her bid in order to get some bribe in return. The same expert further explained that bid rigging is a significant reason behind there being so many plans for plants in BiH. According to the data collected, the bribe is often offered because the new concession holder, or bidder, wants to avoid submitting necessary permits and studies. For example, if the official, often a person working in the concession commission or in the ministry that is responsible, takes such a bribe, no investigation into environmental impact of the plant is demanded. This is important for the bidder because submitting necessary permits and studies as required by regulations is time consuming and can sometimes take years as well as be associated with a high level of administrative complexity. One interviewed consultant and activists argued that it also facilitates the expansion and accumulation of plans as no proper investigations into their impacts and feasibility is required.

The use of bribes is also closely related to the lack of data used for feasibility studies submitted for obtaining a concession, as well as the low quality of this data. As reported by many interviewed experts and consultants, most of the data used for these studies stems from the pre-

[10] Adapted from Jennett (2007)

war era and only a small proportion of this data has been updated after the war. For instance, the feasibility study prepared in 2014 for the small hydropower project in the Martin Brod village was based on the data collected before 1990. This gives leeway to a manipulation of data in favor of investors. For instance, in order to calculate a large amount for water intake which increases the installed capacity of a hydropower plant, environmental consultants, employed by investors, might use data from wetter years and ignore data from relatively dry years. The reason for this manipulation is that domestic investors can better trade their concessions for financial profits to domestic as well as foreign investors if the concessions show a large installed hydropower capacity. A consequence of this is that investors often try to obtain as many concessions as possible in order to trade them. This causes, in turn, a concentration of concessions amongst investors with no actual plans to construct the hydropower plants. As these investors are not forced by officials in BiH to begin construction (something which is clearly exemplified by a continued granting of extensions to such investors by the authorities), many hydropower plans remain just that as they are, in reality, tradable objects. Accordingly, as put by an interviewed bidding expert, a 'business of concession trading' is the primary result. Indeed, some respondents claimed that they knew many businesspeople who owned several hydropower concessions with the sole aim of selling these on.

5. Discussion

Hydropower has been identified as a potential driver of economic development and poverty eradication in the 'hydropower rich' transition and developing countries of the world (IEA, 2000; Merme et al., 2014; Panić et al., 2013; Zarfl et al., 2015). Understood as a clean, renewable, and cheap source of energy as well as providing flood control and creating a source of water supply (IEA, 2000; Manzano-Agugliaro et al., 2017; Panić et al., 2013), hydropower development makes sense. BiH provides a good example of this. Historically, hydropower played a large role in the country and contributed to the economic development of Yugoslavia (Suica, 1971). Combined with a perceived potential for hydropower plants, this past experience has led the World Bank and the EU to take strong initiatives in order to realize the hydropower potential in BiH, making it part of many sustainable development strategies (Chattopadhyay et al., 2017; EU, 2017; European Commission, 2017a; World Bank, 2017c). Consequently, the number of hydropower projects has increased in BiH (Zarfl et al., 2015); a trend mirrored in many other transition and developing countries perceived as hydropower rich (IHA, 2017b).

However, a subsequent increase in the construction of hydropower plants in BiH is not seen (Riverwatch & EuroNatur, 2018a). In Section 3 but mainly Section 5, a review of the major reasons why this is so was presented. In addition to the complex hydropower bureaucracy in BiH, three further problems related to hydropower development in the country were identified. The first focused on the relationship between over-ambitious estimations of exploitable potential, subsequent planning, and the lack of construction of plants – a relationship defined by the ambiguity of the term hydropower potential and the lack of communication between the different administrative units charged with the management of plans. The second highlighted the lack of funding opportunities that can facilitate the move from plans to construction. Although small hydropower plants are less costly than large ones, and thus more easily attract investors (Manzano-Agugliaro et al., 2017), as interviewed experts also pointed out, it is more difficult to attract funding for small size projects as they are perceived as less profitable by multilateral and international financing institutions. Finally, the third problem emphasized how the prevalent corruption experienced in the country, owing mainly to the lack of bureaucratic

transparency, hindered the construction of hydropower projects and caused either termination of projects or long delays in their materialization.

These results mirror the hydropower process in other transition countries in the SEE region. In Serbia, for example, there are currently over 800 planned projects yet only 3.5% of these were under construction in 2017 (Riverwatch & EuroNatur, 2018a). Another example is Albania where, in the same year, the number of projects under construction made up only 20% of the total number of planned projects (Riverwatch & EuroNatur, 2018a). These countries, like BiH, often also use outdated data and statistics when planning and developing hydropower (AEA, 2013; Ratko, 2011). The Albanian Energy Association, for instance, acknowledged that the updated hydraulic statistics needed for better planning were missing (AEA, 2013). The ambiguous nature of the category of hydropower potential is also found throughout the region. In Montenegro, for example, it is claimed that an 'abundance of rivers and streams' can be found and that these add up to an unexploited hydropower potential level of 80% (The US International Trade Administration 2018). Here, as well as elsewhere in the region, however, it is either the technical or the economic potential that is taken into account when highlighting the 'unexploited potential' (IHA, 2016c; Republic of Serbia Ministry of Mining and Energy, 2016). Yet, and as shown in the results, technical or economic potential does not necessarily equate with exploitable potential – for which environmental and social measures should also be taken into account. The lack of funding opportunities is another common issue facing the hydropower sector in the region. As mentioned above, a large part of the hydropower boom consists of small projects and these projects do not tend to attract the multilateral development and investment banks needed to finance their construction. For instance, of the total of 2112 hydropower projects that have either been planned or have been built since 2005 in the SEE region, only 82 of them were financed by multilateral banks and 158 of them were financed by commercial banks (BankWatch & EuroNatur, 2018). This is unlikely to change radically as increasing environmental concerns have lead European development banks, for example, the European Bank for Reconstruction and Development and the European Investment Bank, to be more careful regarding financing hydropower projects (BankWatch & EuroNatur, 2018). In 2013, as a response, the WBIF (Western Balkans Investment Framework) was initiated by the countries in SEE. The WBIF is supervised by the EU in cooperation with the World Bank Group and is charged with identifying gaps in access to domestic and/or foreign finance for domestic investors. However, and as highlighted in the results, widespread vulnerability to corruption means that the hydropower business in the region is insecure and hence does not easily attract foreign investors and lenders. In particular, the development of the hydropower market was not associated with needed public policy and institutional design. This was largely due to a very rapid privatization process in the wake of the wars experienced in the region in the 1990s. Widespread corruption in the sector has been one result throughout the region (Xheneti, 2011), as also seen in our data from BiH. Indeed, the lack of institutional design and the engagement by various private stakeholders has resulted in a very non-transparent and complex bureaucratic sector. A prevalent culture of corruption has been one outcome of this hindering the construction of hydropower plants in the region (Haas, 2008).

The match between our results and findings from the larger SEE region leads to caution against claims that a hydropower construction boom will be experienced there. In light of this, the question arises as to whether this boom can be expected at a global level. This is difficult to say because much of the existing literature on the hydropower boom focuses mainly on the expected benefits or anticipated negative impacts of such hydropower projects while missing information

as to whether these hydropower plants will actually be built, including reasons of why or why not. Thus, the question of 'is the global hydropower boom actually taking place?' cannot currently be fully answered; more case studies like the present one are needed. However, our results combined with those presented from the wider SEE region, in fact, seems to match results from research from other transition and developing countries in the rest of the world experiencing the so-called boom. In Turkey, for instance, there are currently 596 hydropower plants and at least 722 more planned yet only 11.5% of the projects were under construction in 2017 (Yaman & Hasil, 2018). Moreover, the majority of the projects were exempted from the Environmental Impact Assessment Regulation (CBS, 2017) triggering strong public opposition against the construction of hydropower plants (Islar, 2012). Such opposition has also been seen elsewhere, especially in the Southern Hemisphere. In Mexico and Brazil, oppositions have even escalated to a point of violence (Torres-Beristáin & Altamira, 2013; Watts & Vidal, 2017). Nepal is another developing country where more than 285 projects were planned in 2014 (Zarfl et al., 2015), with only 11 of them under construction in 2017 (Alam et al., 2017). A recent study shows that, as in the SEE countries, missing feasibility studies for the planned projects was a major issue in the sector in Nepal (Alam et al., 2017). Poor hydraulic data, manipulation of the existing data, and a lack of transparency also contributed to the lack of hydropower development in Nepal (Transparency International Nepal, 2017). In India, more than 180 hydropower projects with total 44,157 MW installed capacity, excluding those less than 10 MW installed capacity, were also planned by 2015 (Zarfl et al., 2015). Since then, only 4.3% of the capacity has been installed (IHA, 2017c, 2018b). Similarly to elsewhere, a major reason behind this situation was a lack of funding due to the capital-intensive nature of hydropower projects (Asian Development Bank, 2007). By 2014, and at a global scale, more than 7,111 GW of installed capacity was planned to be added to the global existing hydropower capacity (Zarfl et al., 2015). Yet, only 85 GW of it has so far been installed (IHA, 2016a, 2017a, 2018a), or a total of only 1.2% of the planned capacity.

A better understanding of the problems related to the hydropower sector in transition countries in SEE, and in the rest of the world, is hence needed in discussions of the so-called global hydropower boom. This paper is a step in this direction. If these plants are needed for sustainable development (IHA, 2017a; UNIDO & ICSHP, 2016a; World Energy Council, 2016), the findings presented also highlight which existing and widespread problems that need to be resolved in these countries before this boom can materialize. In other words, if the exploitable potential is not taken into account and calculated correctly, if social and environmental impact assessments are not done properly, if the financial feasibilities of the projects are not well investigated by the officials before granting concessions, and if the high corruption vulnerabilities still dominate the socioeconomic situation in many transition and developing countries, it is highly questionable that the global hydropower boom will actually take place in the manner that has been predicted by much recent literature (Kelly-Richards et al., 2017; Smits & Middleton, 2014; Zarfl et al., 2015).

6. Conclusion

The global hydropower boom is widely described and discussed in the literature. So far, researchers have focused largely on either the potential benefits or the potential social, environmental and political challenges or problems of this boom. In this paper, the existence of the hydropower boom is questioned as the large amount of planned projects globally has not resulted in a related mass construction of plants. Presenting data from a case study in BiH, it is

showed how over-ambitious planning, complex administrative features, a lack of funding opportunities, and prevalent corruption stalls and even prevent plans from turning into plants in BiH. While acknowledging the limitations of a case study, these results mirrors closely the few findings from countries elsewhere in the region and globally. This causes us to argue for more in-depth knowledge of not only the potential benefits and disadvantages related to hydropower but also for more knowledge on the processes hindering or facilitating the construction of such plants in the first place. In light of growing global environmental concerns and focus on renewable energy production in the striving to mitigate climate change, such research is crucial. If hydropower is desired, and the global boom is to be realized, our results indicate that a first step is not necessarily more plans and funding for plans, but rather research and subsequent understandings of the reasons hindering such plans from materializing.

Chapter 3 - The on-paper hydropower boom: A case study of corruption in the hydropower sector in Bosnia and Herzegovina

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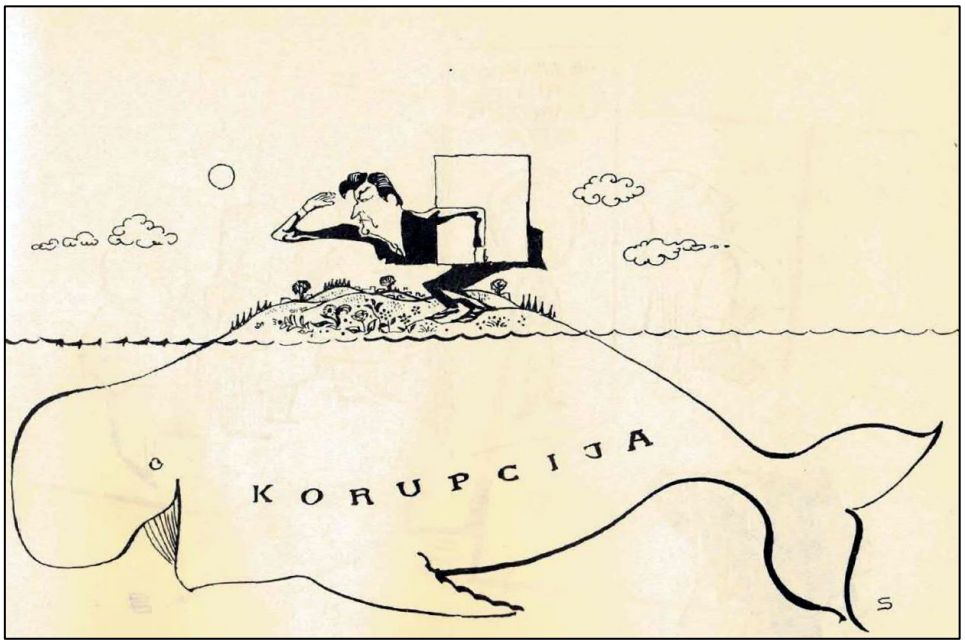
Özge Can Dogmus and Jonas Østergaard Nielsen



(*Corruption*, Stefanovic (2000))

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Abstract

The demand for hydropower production, as a prominent sustainable development strategy, has created a boom in the number of planned hydropower projects, especially small ones. These projects are mainly located in post-socialist transition and developing countries. However, emerging evidence suggests that most of the projects remain on paper. One reason for this is prevalent corruption. In the literature, corruption has been identified in megaprojects but a significant number of hydropower projects are smaller in size. This leaves a literature gap and a subsequent lack of understanding regarding corruption and its potential connection to the absence of hydropower construction. We argue that it also creates a 'safe space' for corrupt actors who use the sector for personal gain. In this paper, we address this nexus of unfinished hydropower projects, sustainable development in transition countries, corruption, and lack of scholarly attention by presenting empirical evidence from Bosnia and Herzegovina. We highlight that sustainability goals associated with hydropower might be distorted, especially in transition countries as they are intermingled with hydropower projects that are embedded in complex bureaucratic structures. We conclude that focusing on the sector might improve its management, thus contributing to sustainable development, and also help to decrease the corruption risk.

1. Introduction

Private hydropower generation is an important component of sustainable development strategies in many developing and transition countries (IRENA, 2017; UNIDO & ICSHP, 2016a). Adoption of hydropower is motivated by the desire to fulfil international agendas such as the United Nations Sustainable Development Goals, encourage structural and behavioural change and, through this, contribute to social and environmental protection. This, in turn, allows countries to become eligible for international funding (Panayotou, 2013). Hydropower generation is thus a good solution for decisionmakers in water-rich developing and transition countries as it is a source of renewable energy production and therefore considered environmentally friendly and economically profitable (Jenssen & Gjermundsen, 2000). Currently, more than 3,700 hydropower projects are planned worldwide with the majority of them located in post-socialist transition and developing countries[1] (Zarfl et al., 2015). Of these, more than 37%[2] are small projects.

The potential environmental, social, and economic impacts of hydropower, such as an altered hydrological regime (Räsänen et al., 2012), water grabbing (Dell'Angelo, Rulli, & D'Odorico, 2018), poverty due to forced resettlement (Cernea, 2004), and reduced access for locals to natural resources (Siciliano & Urban, 2017) have been highlighted in the literature. Additionally, there is a growing literature that argues that the cumulative impact of small hydropower plants might be greater than the impact of larger projects (Athayde et al., 2019; Fung et al., 2018; Kelly-Richards et al., 2017). Nevertheless, it is unlikely that many of these projects will be constructed (Dogmus & Nielsen, 2019). Prevalent corruption, especially in transition countries, has been put forward as one of the chief explanations for this (Haas, 2008; Jennett, 2007; Shandling & Lock, 2008). The existing literature on how corruption hinders the materialisation of hydropower plants largely focuses on corruption in large projects or megaprojects (Mertha & Lowry, 2006) as well as what the potential social, economic and environmental consequences of these projects might be (Kirchherr, Pomun, & Walton, 2018). Little is known about small unbuilt projects. This research gap might be the result of difficulties related to collecting information, problems that arise when dealing with the enormous number of projects, and the financial costs of monitoring small projects in comparison to megaprojects. Moreover, empirical analysis of corruption is limited due to difficulties associated with research on corruption, such as the difficulty of collecting information on sensitive topics, the illegality of the practice, dangers associated with speaking about it, and the issue of the need for informants to remain anonymous (Numerato, 2015; Torsello, 2011). Simply put, collecting data and documenting corruption is difficult. More research on the hydropower boom and corruption is nevertheless needed (Dogmus & Nielsen, 2019), as is more empirical work on corruption in general (Torsello, 2011).

In this paper, we explore the case of Bosnia and Herzegovina (hereafter BiH, derived from Bosna i Hercegovina). BiH is one of the transition countries where an on-paper hydropower boom has been observed (Dogmus & Nielsen, 2019). Beginning in the 2000s, in order to reach its 40% renewable energy target (EU, 2009a), BiH initiated a rapid increase in the number of

[1] There is no global consensus on the categorisation of hydropower projects depending on their sizes. Most countries consider projects with less than 10 megawatts (MW) of installed capacity as small (Kelly-Richards et al., 2017). This general trend is what we adopt in this paper as well.

[2] Zarfl et al. (2015) exclude projects with less than 1 MW of installed capacity and those that are not officially registered.

hydropower projects. In 2017, the number of planned hydropower projects was almost 300, 251 of which were small-scale projects, and only 19 of which were actually under construction3 (Riverwatch & EuroNatur, 2015, 2018a). Hydropower development as a sustainability strategy has not been successful so far. The aim of this study is to explore why and what role documented prevalent corruption in BiH [13] plays in this. We understand corruption as the misuse of entrusted public power for personal gain (Transparency International, 2019; Wilhite, Goldstein, & Whelan, 2016). In transition countries, corruption is rather pervasive (Arapović, Depken, & Hadžikadić, 2017; Shaomin Li, 2019; Zurnić, 2019). We show that corruption in small-scale hydropower projects, while less widely addressed than corruption in large-scale hydropower projects, is at play in the case study. When we consider that small-scale projects are overlooked in the literature, this finding merits attention as these projects are equally tied to sustainability discussions and programmes.

The paper is structured as follows. In Section 2, we present the literature review. We focus on corruption risks in the hydropower sector as well as its connection to unbuilt hydropower projects. In Section 3, we present the contextual settings and detail the administrative system and the hydropower bureacracy in BiH. Section 4 presents our methods and Section 5 compiles our results. In this penultimate section, we focus on the ways in which corruption is sustained and reproduced in the sector. The results are followed by a discussion and a conclusion in Section 6.

2. Corruption in Bosnia and Herzegovina

2.1. Complicated administrative system

Bosnia and Herzegovina was one of six republics of the Socialist Federal Republic of Yugoslavia (1945–1992, hereafter Yugoslavia). Like the other republics, BiH experienced a war between 1992 and 1995 that was waged mainly between Bosniaks, Serbs and Croats. On December 14, 1995, a peace agreement, the Dayton Agreement (hereafter Dayton), separated the new country into two semi-autonomous entities, *Republika Srpska* (RS) and Federation of BiH (FBiH), as well as a district named Brčko. Both entities have their own autonomous parliaments and presidents (Figure 3-1). FBiH is divided into ten cantons, each with its own semi-autonomous government (Divjak & Pugh, 2008). At the state level, a tripartite presidential system was established that revolves around the elected leaders of the three dominant ethnic groups, i.e. Bosniaks, Serbs, and Croats (Papon & Pejovnik, 2006). As a result, BiH is now considered to have one of the most complicated administrative systems in the world (Nardelli, Dzidic, & Jukic, 2014).

[3] These numbers are attached with uncertainty as there is no state-level registry for planned hydropower projects.

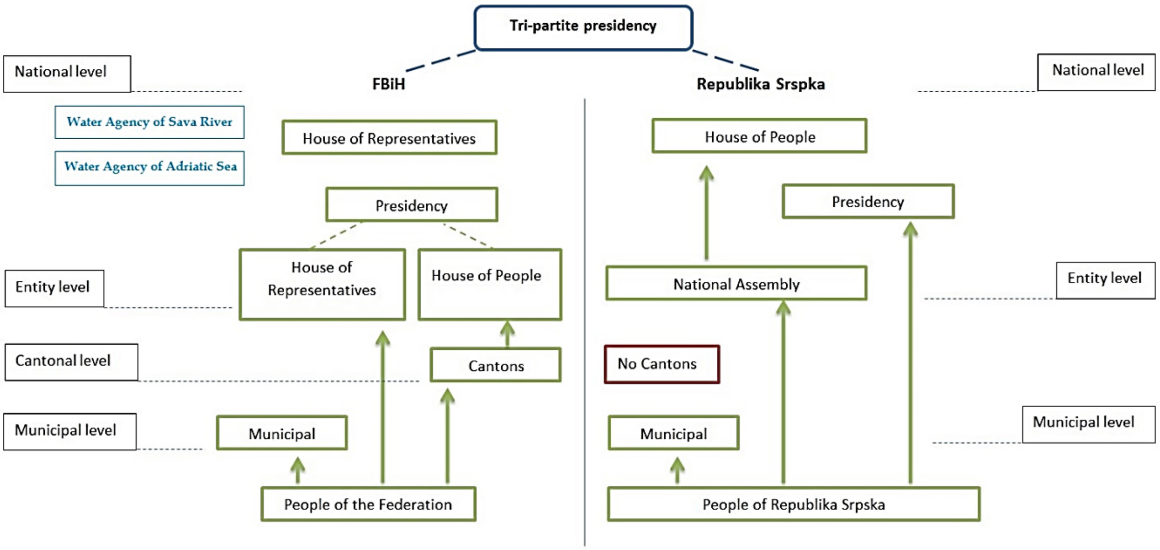

Figure 3-1 The administrative system of BiH, FBiH and RS

In BiH, this complicated administrative system has created fertile ground for corruption (Belloni & Strazzari, 2014; Divjak & Pugh, 2008). Corruption, especially after the war, has become "standard operating procedure" in BiH (Belloni, 2020, p. 58) and the fight against it has yielded no visible positive results (Lee-Jones, 2018). According to Transparency International's Corruption Perception Index (2018), the country's score in 2018 was 38 on a scale of 0 (highly corrupt) to 100 (very clean).

2.2. The hydropower sector

Hydropower has been important in the country since the time of Yugoslavia (Suica, 1971) and has become one of the major drivers of sustainable development in post-war BiH (Chattopadhyay et al., 2017; Hadzialic, 2016). By 2016, the total technical hydropower potential[4] of the country was 6,110 MW (IRENA, 2017) with only 27% of this total exploited (IHA, 2016b). In 2017, approximately 300 hydropower plants were planned in BiH (Figure 3-2Figure 2-4), up from 165 in 2015 (Riverwatch & EuroNatur, 2015).

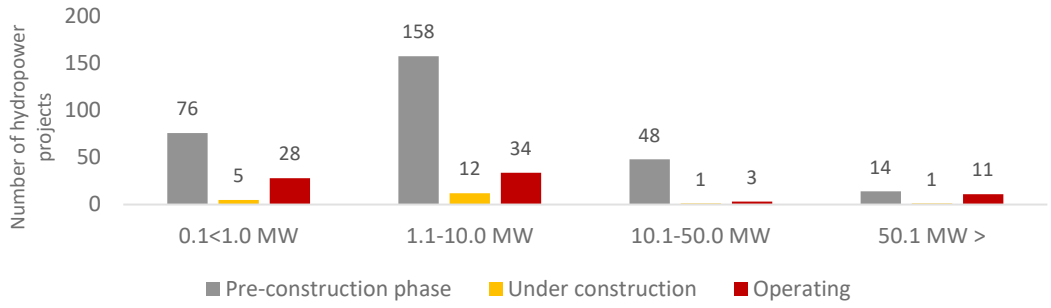

Figure 3-2 The distribution of hydropower projects according to their sizes and phases in BiH in 2017[5]

[4] Technical potential indicates the potential that could be harnessed using existing technology.
[5] Adapted from Riverwatch & EuroNatur (2018)(Adapted from Riverwatch & EuroNatur, 2018a)

In 2017, only 6% of planned projects were under construction (Riverwatch & EuroNatur, 2018a). It was 7% in 2016 (Muharemovic, 2016) and 8% in 2015 (Riverwatch & EuroNatur, 2015). In 2016, a majority of the planned projects were determined to be on-paper due to evidence such as a lack of ongoing activities at the project site (9%), their status was unknown (17%), or the projects were abandoned (13%).

Globally, the hydropower sector experiences high levels of corruption (Table 3-1) including in BiH (CIN, 2015). One reason for this is the large inflow of money into the hydropower sector from foreign investors and organisations. In 2013, for instance, the total amount of the loans received from the European Bank for Reconstruction and Development (EBRD) for investment in hydropower projects in BiH was €35 million (Panagopoulos, 2013). This was at a time when the GDP of BiH was €24,178 billion (World Bank, 2013) and an estimated €200 million of EU funding earmarked for hydropower development in the years 2008–2018 had been used for undocumented transactions (Garaca, 2018). This is significant when we consider that the total capital loaned by the EBRD to BiH is €50.1 billion (EBRD, 2019).

Table 3-1 Common forms of corruption in the hydropower sector, from project selection to implementation[6]

Project Phase	**Project Selection/ Identification**	**Planning**	**Bidding, Evaluation, Contracting**	**Construction/ Implementation**
Corruption Risks	A limited number of options are considered	Feasibility studies are done improperly*	Opaque pre-qualification and bidding procedure*	Not fulfilling promises and requirements and bribing officials to avoid project delay penalties*
	Pre-determination of projects before feasibility studies[7]*	Being biased to a particular type of technology	Accepting improper bidding documents*	Biased project supervision
	Limited public involvement*	Over or under design	Bidding selection is not made public and/or not justified*	Not taking action against environmental violations
	Limited influence of project-proponents*	An opaque environmental and social impact assessment procedure*	Deception and collusion*	Corruption in processes of resettlement and compensation

The complicated hydropower bureaucracy in FBiH is partly to blame for this. For instance, the responsibilities regarding hydropower investments in FBiH are distributed among 79 municipalities, 30 cantonal ministries, 12 concession commissions, three federal ministries, and two water agencies. A hydropower project in FBiH requires almost 50 types of permits (FBiH, 2012). These are to be obtained at different administrative levels depending on the size, type and location of the project. This makes it difficult and time-consuming to obtain permits or even to identify which are necessary and which authorities grant them (FBiH, 2012).

[6] Adapted from Jennett (2007)

[7] Items marked with (*) are also the aspects that were found to pertain to our case study.

3. Methods

A mix of qualitative research methods, i.e. semi-structured interviews, informal conversations, and participant observation, was applied to explore how the hydropower sector functions at different social and political levels in BiH. As the two entities, i.e. FBiH and RS, have independent energy policies, we focused on FBiH, which has greater administrative complexity due to being divided into 10 semi-autonomous cantons. Where it was necessary to understand the country context, interviews were conducted with officers in RS as well.

A total of 35 semi-structured interviews were conducted with local authorities, civil society organisations, international development and aid agencies, public and private energy companies, investors, experts and consultants, water agencies, concession commissions, ministries at all administrative levels, and other bureaucrats. Semi-structured interviews were supplemented by numerous informal conversations with various stakeholders within the hydropower sector. A full list of respondents can be found in Appendix A.

The data was collected by the first author in Bihać, Banja Luka, Sarajevo and Mostar in BiH between July and October, 2016 and between July and August, 2017. Three interviews were conducted via telephone and Skype in English in March, 2017. 27 of the semi-structured interviews were conducted in Bosnian, Serbian, or Croatian and two translators assisted the first author during the fieldwork. We acknowledge that language might influence the research product (Temple & Young, 2004) but we did not deal with language-sensitive issues such as race, gender or ethnicity (see Filep, 2009). Most interviews were recorded by a voice recorder and all were transcribed into English by the field assistants. The rest of the interviews, including field observation collected via participant-observation, were documented in written notes in the field and during and after interviews. In addition to the qualitative data, secondary data was collected from sources such as official statistics, technical reports, government documents, civil society reports, historical documents, and official media reports. Both primary and secondary data were analysed using MAXQDA 2018.

2. The ways in which corruption is sustained and reproduced in the hydropower sector in BiH

2.1. Everyday corruption in the hydropower sector

Many respondents from the sector claimed to be clean yet told many corruption stories about other people. Various forms and scales of corruption in the hydropower sector in BiH were identified during the fieldwork. For example, one respondent explained how he, while being a member of a cantonal assembly, had been asked by a foreign company to be a mediator for a hydropower investment case. The same informant stated that the same company promised the then cantonal Prime Minister that €150,000 would be transferred into his personal account if he agreed to grant three hydropower concessions to them. The then cantonal Minister accepted this offer according to the informant.

Bribery is indeed a prevalent form of corruption in BiH. It is also seen in connection with sidestepping, obtaining and submitting necessary permits and feasibility studies while applying for tenders. Investors and officials stated that these permits take a long time to obtain, sometimes even years, because of the administrative bureaucracy. To investors, consultants, and some decisionmakers, bribery speeds this process up but it also circumvents it totally in some cases. A water agency official stated that, even when investors do apply for all necessary

permits, they often manipulate the submitted data. She added that a large amount of data used for these studies is from the pre-war era and only a small proportion of this was updated after the war, which leaves leeway for manipulation of data in favour of investors. Another water agency official stated that environmental consultants employed by investors often use data from years with more rainfall ignoring "worse" data, as it was often put in interviews. This was done in an attempt to increase the installed capacity of a hydropower plant and thereby enhance its value. To experts interviewed, public officers turn a blind eye to this, i.e. they do not ask for repeat assessments and up-to-date and reliable data, due to bribes.

2.2. Increasing corruption risk in the hydropower sector

One officer stated that "the hydropower sector is a big zone of corruption" (RES32) and corruption was considered "normal" among the respondents. Being an honest businessman was seen to be a problem because, as one hydropower investor explained: "Then you cannot win any bids. […] This is Bosnia [and Herzegovina], it is totally normal. You cannot call it illegal" (RES52). According to another hydropower expert, "the possibility of a corruption-free hydropower sector is impossible" (RES51). A common observation of the respondents was that the administrative system of the country was built on gaps that allowed corruption to be overlooked at all levels – from small businesses to the legal system. According to our understanding, it was not considered important that corruption involved in small projects should be punished. During an informal talk, for instance, a local expressed his disappointment because the former mayor of his city was arrested "just because of receiving €1,000 as a bribe".

Hydropower bureaucracy, together with the complicated administrative system, has created legal gaps and a "free-space" for corruption, as it was called by our informants. This is especially true at the cantonal and municipal level in FBiH where, to a large extent, public offices are able to define their own rules independent from federal or state-level regulations. An aid agency officer explained how local decision-makers bend rules in order to include more small projects into their administrative scope, which also creates more opportunities for personal benefit:

> *According to [the FBiH] law, hydropower plants that are bigger than 5 MW [installed capacity] should be in the competence of the Federation. But when you look at cantonal laws, some of the cantons define their [own] competence […] for all [sizes of] hydropower plants […]. So, you can see that there is a certain overlap.* (RES62)

This overlap, combined with the lack of a central registry and office for planned hydropower projects, increases the possibility that local actors can make independent and unchecked decisions about small hydropower projects. While, in theory, the Federal Ministry of Agriculture, Water Management and Forestry needs to be informed when a cantons change their spatial plans, this is often not done. Indeed, as a director of one of the water agencies explained: "must and do are completely different things in BiH'' (RES63). During the fieldwork, this lack of registration and reporting was confirmed by experts at the Ministry. They did not, for example, know the total number of the planned hydropower projects in FBiH. Only the number of large hydropower projects was known as they were registered by the FBiH or BiH state.

Not only is there a lack of reporting and central registration, there is also a lack of a central mechanism of control. Only two water agencies investigate existing and planned projects on

river basins in FBiH, and then only the large basins. Indeed, these water agencies, as they themselves claim, are totally uninformed by their colleagues from the concession commissions regarding the locations and the number of newly added projects. Small projects and small river basins are not controlled by any central mechanism and it is unclear whose responsibility this even is. "The problem is small watercourses", said one water agency expert. Another continued: "We have a big problem with the small watercourses as we do not have data on the locations of small hydropower projects" (RES63).

To the FBiH water agency experts, it all seemed rather ad hoc. With no system to track concession granting and conduct any subsequent monitoring of project progress and concession payments, this is no wonder and is again connected to administrative complexity. For instance, the conditions of concession contracts might be changed by one public office after they were granted without informing other responsible authorities about them. This makes it exceedingly difficult for the authorities to administer or establish which legislation is the most current or which applies to which project as stated by officials. One respondent from a civil society organisation explained how changing conditions often result in difficulties in identifying and tracking investors and monitoring projects. This issue, according to almost all of the respondents, is affecting the transparency of the hydropower sector.

The lack of transparency also affects the duration of idle concession contracts, i.e. those that have made no progress since they were granted. Several officers of concession commissions disclosed that, in practice, there is no strict deadline for the materialisation of projects and, consequently, many concession holders keep postponing their commencement – often for unknown reasons. An example of this is a project on the Janj River where the concession was granted in 2005 but the project had not begun at the time of fieldwork. Many respondents explained that the officials in charge of administrating the concessions prefer not to revoke them without the consent of the investors. No major reason for this was given by the authorities – they mostly said that they did not see any point in revoking an existing project. One consequence of this to investors, consultants, and experts in the sector, is that concession trading often occurs and is undocumented as private agreements. Many investors were observed to be trying to obtain as many small hydropower concessions as possible in order to trade them privately. According to local stakeholders, activists, and civil society organisations, obtaining these concessions and extending concession durations, while giving no proper reason, was said to be a practice facilitated by bribery. Experts and water agency officials argued that many of these concessions lacked necessary feasibility studies or permits. Interviewed experts and consultants also told us that it is often domestic investors who obtain these concessions in order to trade them to foreign investors – often for large profits and unofficially. As interviewed consultants stated, foreign investors can better afford high concession prices and have relatively poor knowledge of how corrupted the hydropower sector in BiH is (RES40).

3. Discussion

In many transition countries, hydropower has become, to a large extent, part and parcel of sustainable development strategies (IRENA, 2017; SDGF, 2017). Known as hydropower-rich, BiH is one of the transition countries where this is evident (Ding & Sherif, 1997; UN & SDG, 2018). In 2017, there were almost 300 planned hydropower projects, the majority of which are small projects (Riverwatch & EuroNatur, 2018a). However, only a small percentage of these projects have materialised while the rest have remained merely as plans, some for more than 10 years (Muharemovic, 2016). The reasons why these projects do not materialise are diverse,

but one chief reason put forward is the prevalent corruption in the sector and in the country in general (Dogmus & Nielsen, 2019).

Corruption is a major concern in the hydropower sector globally (Cooley et al., 2014; Shandling & Lock, 2008; Transparency International, 2008). As we show in our results, this is also the case in BiH. Here, corruption manifests as concessions being granted without submittion of an official application and/or without obtaining necessary permits or conducting impact assessment studies. This is done by officers who ignore improper impact assessments that lack documents, or through undocumented concession trading. In all these examples, bribes play a key role. This paper, being an empirical work, i.e. a case study of corruption in the hydropower sector, is of particular importance for the literature as a more in-depth understanding of corruption is needed (Torsello, 2010b).

Prevalent corruption in the country is one reason for the corruption in the hydropower sector: corruption is often self-sustaining (Köbis et al., 2017). Corruption in the hydropower sector in BiH sustains and reproduces itself through bureaucracy and the complicated administrative system of hydropower in BiH. As highlighted in this paper, this especially leaves small projects without existing inspection mechanisms, enables corruption and increases corruption risks in the sector. Hence, it leaves small projects open to corruption. At the cantonal and municipal level, many actors were said to bend the rules, take advantage of legal gaps, and ignore existing laws and regulations for their own benefit. This is especially true for small hydropower projects as, in contrast to larger ones, these are not under the administration of the entities, namely, FBiH and RS, or BiH officers. This means that they are small enough to "hide" from other authorities. It is, consequently, also easier to obtain small hydropower concessions compared to large ones in BiH and the hydropower boom in the country consists of a significant number of small projects.

This is an important insight as the majority of the literature on corruption in the hydropower sector in developing and transitioning countries focuses on megaprojects and how they create space for corruption (Ansar et al., 2014; Kirchherr et al., 2018; Locatelli et al., 2017; Mertha & Lowry, 2006). Indeed, to our knowledge there is no other case study exploring corruption in small hydropower projects, yet, and as our results illustrate, corruption in the hydropower sector also takes place there. Overlooking this can create a 'safe space' for corruption. Our results illustrate how corruption is sustained because the authorities do not know what the legislation that pertains to the projects is, who owns them, or the exact location of the proposed projects. This is because these factors change over time. The small size of the projects is therefore advantageous for corruption as these projects get lost in the complicated administrative system found in BiH. This convoluted system also makes it difficult to identify which authorities are supposed to administer and oversee hydropower projects. This, in turn, facilitates corruption since the chances of being caught are low. Moreover, the risk of corruption connected to the sector in BiH does not go away as the projects remain on paper. The undocumented and private concession trading business illustrates that the on-paper hydropower boom carries the future potential for increasing corruption within the sector.

Making a clear statement regarding the corruption involved in small projects is difficult, however, just as it is regarding corruption in general (see also Jain, 2001; Khan, 1996; Olken, 2009). For example, we do not know the exact amount of money that is syphoned off and have no concrete evidence of corruption. However, approaching the hydropower boom in BiH as an example of a "hydropower assemblage" (Gutierrez et al., 2019) helped us identify the multiple

scales and relationships entangled within the boom and how corruption traverses these. The results highlight this and that it is possible to identify that corruption is taking place even without documenting it as such.

We believe that it is essential to keep this in mind. Considering that global players like the EU increasingly encourage states in transition countries and elsewhere to support and implement sustainable solutions to ecological and economic problems via renewable energy projects such as hydropower, more research on corruption within this sector is urgently needed. Indeed, our findings align with findings from other transition countries, particularly in the South-East European region. For instance, in Albania, a hydropower-related conflict assessment study shows that 15% of the local stakeholders of different hydropower projects had observed corruption involved in these projects (HELP-CSO, 2017). In Montenegro in 2017, only one out of 81 planned projects was under construction (Schwarz, 2017) and a case study on corruption there showed that the hydropower sector has become an alternative business among the close relatives of government members, indicating favouritism and nepotism (MANS, 2017). For Kosovo, the European Parliament announced a high-level of corruption in various dominant businesses in the country, including the hydropower sector (European Parliament, 2018). There are also many other reports and case studies from elsewhere in the world on high corruption rates in the hydropower sector although these, as mentioned above, cover only large projects (e.g. Hadzialic, 2016; Simpson, 2007; U4, 2009; WWF, 2014). Clearly, this is hardly in line with what hydropower is said to help achieve – namely, sustainable development.

4. Conclusion

Hydropower development is one of the major sustainable development strategies in transition and developing countries. This has led to a global boom in the sector, as well as in BiH. A part of the hydropower literature has focused on how it paves the way for corruption, mainly connected to large or megaprojects. By focusing on small hydropower projects, our findings show that corruption also takes place there, and that this is closely connected to the complicated administrative system found in BiH and how this has created a 'safe space' for corruption. Bribes were found to take place at all phases of the hydropower project process but, since most projects remain unbuilt and on-paper, bribes are most prevalent during the planning phase. Our findings, therefore, highlight the role of corruption in small hydropower projects in BiH. This paper is significant for the literature as more empirical work on corruption is needed. Further research would help us to achieve a better understanding of the reasons behind corruption and how it is sustained and reproduced. This paper is a step in that direction.

Chapter 4 - Defining sustainability? Insights from a small village in Bosnia and Herzegovina

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Özge Can Dogmus and Jonas Østergaard Nielsen

(Photos: Özge Can Dogmus)

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Abstract

The term “sustainability” is flexible as it needs to function in many different contexts and across many issues. At the same time, this flexibility makes it difficult to assess and easy to misuse. Over the last three decades, numerous sustainability assessment tools have been developed to better define the term. In this paper, we critically address these attempts and argue that the flexibility of the term is not solely problematic, but allow people to create their own sustainability imaginaries, by which we mean a society’s understanding of how environmental resources should be used. We show this through a case study, the Martin Brod village in Bosnia and Herzegovina, where, within a few years, the inhabitants changed their sustainability imaginaries in parallel with shifting external socio-economic conditions and expectations. We primarily applied qualitative research methods. Our results show that changing sustainability imaginaries was made possible due to the flexibility of the term which enabled otherwise disempowered local inhabitants to have agency. Consequently, a stricter definition of sustainability may have unintended consequences for people struggling to maintain a political voice in settings such as Bosnia and Herzegovina.

1. Introduction

Since the late 1980s, the use of the term sustainability has gained prominence and is applied extensively in international policy and research agendas despite being difficult to define and measure (Schröter et al., 2017). To address this, researchers and decision-makers increasingly argue that we need to come up with better definitions as well as objective operational principles, frameworks and tools (Miller, 2007; UN, 2007). A key aim of this exercise is to curb the term's opaque nature, making sustainability assessment challenging (Bell & Morse, 2018; Garrett & Latawiec, 2015) and the misuse of the term possible, such as in the case of greenwashing, referring to the misapplication of the principles of environmental marketing to implement cosmetic changes legitimising unsustainable business activities (Brown, Hanson, Liverman, & Merideth, 1987; Hamann & Acutt, 2003; Karna, Juslin, Ahonen, & Hansen, 2001; Lyon & Montgomery, 2015). However, such efforts have been criticised for reducing complexities into rather simple signals that attempt to measure the immeasurable (Bell & Morse, 2018). Social values represented as numbers and concrete definitions, such as well-being, happiness, and fulfilment, have been shown to not capture the dynamic and complex nature of communities (Bell & Morse, 2003). Despite these critiques, research on better defining and hence determine sustainability continues, exemplified by the development of sustainability indicators (e.g. A. L. Dahl, 2012; Hicks et al., 2016; M. Li, Wiedmann, & Hadjikakou, 2019; Rasmussen, Bierbaum, Oldekop, & Agrawal, 2017).

While we acknowledge that there is an important rationale behind creating clearer definitions of sustainability to avoid the misuse of the term, we argue that doing so might remove options for people who are struggling to determine their own present and future. Concretely, we use the case of a small village, Martin Brod, in Bosnia and Herzegovina to argue this point. At the state level in Bosnia and Herzegovina, hydropower and ecotourism are put forward as two crucial sustainable development strategies (BiH, 2011; Smajic, 2019). Both of these strategies have played out in competition with each other in Martin Brod. This situation, we show, was used by the inhabitants to change their mind over time about which of the two strategies they found sustainable. A change of mind which was closely related to their understanding and use of the term sustainability as well as the socio-economic situation in the village. As such, our results align with an understanding of sustainability that emphasises the flexibility of the term and the inherent potential in this flexibility to foster transformative solutions, or, as put by Loorbach et al. (2011), "adopting a view on the transition to sustainability implies an integrative view of sustainability, which is capable of incorporating multiple domains, multiple levels of scale and spans a long-term". To show this dynamism and complexity, we draw from the literature on imaginaries (e.g. Levy et al., 2013; Lotz-Sisitka, 2010; C. Taylor, 2004), specifically on sustainability imaginaries (Cidell, 2017). Imaginaries are a society's imaginative capacity to help make sense of the exterior world (C. Taylor, 2004) which are various and transform over time (Cidell, 2017; C. Taylor, 2004).

The paper is organised as follows. First, we briefly review the literature on attempts to define and determine the sustainability term and the literature on sustainability imaginaries. Then, we present the empirical setting and methods used. Third, we move to our results. These are presented in sub-sections covering i) planned hydropower plants, ii) opposition towards these projects, iii) ecotourism and the failing promises of the Una National Park (UNP), and iv) a return to hydropower based on changing external conditions. In the discussion, we argue that from the inhabitants' perspective, the flexibility of the term sustainability is crucial and we use

this finding to reflect upon the push within sustainability research to define and determine the term. A conclusion wraps up the paper.

2. Theoretical background

2.1. Attempts to define and determine sustainability

The most well-known definition of sustainability is found in the Brundtland Report (WCED, 1987) and in which it is the "development that meets the needs of the present without compromising the ability of future generations to meet their own needs". This is a loose definition but making the term's comprehensive definition is difficult due to its inherent flexibility, arising partly from its context-specific nature (Weaver, 2006). Its context-dependency has resulted in a variety of versions of the sustainability definition (e.g. Heinberg, 2010; Kuhlman & Farrington, 2010; Parris & Leiserowitz, 2005). This variety has been a course of concern for scholars and decision-makers, and determining and categorising targets, indicators and frameworks crucial in identifying what exactly to sustain, for whom, when and why have been an on-going process (Garrett & Latawiec, 2015; Pintér et al., 2012). Especially, after the UN's Earth Summit in 1992, "a virtual explosion" (J. Robinson, 2004, p. 374) of attempts to determine the sustainability concept by means of developing sustainability standards, certifications for products and services, and monitoring tools have been observed (Pintér et al., 2012).

To illustrate, one of these tools are sustainability indicators (Parris & Leiserowitz, 2005). They are defined under each sustainable development goal individually (Hák, Janoušková, & Moldan, 2016; Schader, Grenz, Meier, & Stolze, 2014). GDP per capita, ecotourism ratio in the total economic growth, and unemployment rate are, for instance, used to evaluate whether a country is successful in achieving economic growth and decent work for everyone whereas indicators such as share of renewable energy in the total energy generated and accessibility to international financial flows in support of clean energy are used to assess whether access to clean energy for all is possible (National Research Council, 2011). Indicators, in general, are claimed to be easy to understand, reliable, based on accessible data, and suitable for standing in for complex conditions which otherwise could not be measured directly (UNECE, 2005). Next to being used to evaluate if we are moving toward a sustainable future (Kuhlman & Farrington, 2010), they aim to be informative for decision-makers (Miller, 2007) and to limit the space for the term's misuse arising from its context-dependency (Hák et al., 2016; Karna et al., 2001; Missimer, Robèrt, & Broman, 2017). In other words, sustainability indicators are meant to be representational and to have qualities of performativity to be used to make sense and respond to different situations (Hale, Legun, Campbell, & Carolan, 2019).

Yet, such attempts of determining the term have been criticised for not being suitable enough to represent the dynamic interaction between social and ecological systems (Bell & Morse, 2008; Morse, 2013) due to trying to find out the truth of sustainability and being static, mostly top-down, and expert-driven (Bell & Morse, 2008; Morse, 2013). Central to this critique is an understanding of nature and society as being in constant flux and hence ultimately unmeasurable (see Alrøe & Noe, 2016; de Olde et al., 2018). Robinson (2004) argues that no single approach or definition should be considered the "truth" of sustainability,

> *rather it is more usefully thought of as approach or process of community-based thinking that indicates we need to integrate environmental, social and economic issues in a long-term perspective, while remaining open to fundamental differences about the way that is to be accomplished and even the ultimate purposes involved* (p. 381).

Such critiques have led scientists to make sustainable assessment tools more integrative through, for example, engaging communities (Magee et al., 2013), yet problems still remain concerning the inherent drive in many of these attempts to reach a common and shared understanding of the term (Alrøe & Noe, 2016; Schader et al., 2014). If boundaries are set to rigidly represent "ideal-typical worldviews", the concept would very likely be too simplistic (Rigolot, 2018, p. 21). It would also be hegemonic (Ingold, 2016) because it would not allow everyone to represent their voice, i.e. to have agency (Klugman & World Bank, 2014), which alone could be a tool for empowerment (Beaumont, 2010). Agency has this capacity because when it is exercised by individuals and groups, it shapes social, political, and economic structures (Gammage, Kabeer, & van der Meulen Rodgers, 2016), e.g. how sustainable decisions are made and exercised. Therefore, if the less powerful groups do no express their voice, they would lack agency, the legitimacy of the sustainability knowledge produced would be simplistic and hegemonic hence the integrative aspect of sustainability would be questionable (de Olde et al., 2018). Moreover, such clear boundaries, in addition to being too simplistic, can also be misused for political ends, resulting in polarised debates (Bell & Morse, 2018), such as in the case of post-truth politics (see Higgins, 2016; Lewandowsky, Ecker, & Cook, 2017). Thus, the flexibility of the sustainability term is maybe its strength and not weakness (Alrøe & Noe, 2016; Parris & Kates, 2003) bearing in mind that this flexibility makes the term integrative (J. Ø. Nielsen et al., 2019; J. Robinson, 2004).

2.2. Sustainability imaginaries

Imaginaries are simply defined as a society's imaginative capacity to help make sense of the exterior world, i.e. as a template for thought and action (Hauer, Østergaard Nielsen, & Niewöhner, 2018; Lotz-Sisitka, 2010; M. Nielsen & Pedersen, 2015; C. Taylor, 2004). Thus, imaginaries both inform and transform experiences and visions of moral behaviour and social order (Smith & Tidwell, 2016). They are "carried out, reinforced, and reinterpreted through everyday practices and institutions" (Cidell, 2017, p. 171), which makes them open-ended and flexible (M. Nielsen & Pedersen, 2015). Such traits of imaginaries allow people to transform (i.e. take up and improvise) their existing imaginaries into new viable forms (C. Taylor, 2004) when there are changes in their political, economic (Jessop, 2010), and/or ecological conditions (Levy et al., 2013).

As "[w]e are living in the age of diversity" (Vertovec, 2012, p. 287), multiple imaginaries exist simultaneously that are almost always contested (C. Taylor, 2004). To illustrate, Levy et al. (2013) identified four major climate imaginaries in the US which had an influence on the rise of clean energy in the country from the 1990s onwards until it stalled around 2010. By being contested and dynamic, imaginaries can produce winners and losers (Davis & Burke, 2011). Next to the multiplicity of imaginaries of one single case/situation, there are also various forms of imaginaries that are theorised by academics, such as social (e.g. C. Taylor, 2004), sociological (e.g.Mills, 1959), sociotechnical (e.g. Jasanoff & Kim, 2015), and spatial imaginaries (e.g. Watkins, 2015). These are in addition to those imaginaries that highlight the perspective of the imagining subjects, such as migrant (e.g. Camacho, 2008), queer (e.g. Tongson, 2011), and middle-class (e.g. Reay, 2007) imaginaries.

Drawing from this large literature, Cidell (2017) suggests a new form of imaginaries, namely sustainability imaginaries, "as a way to understand the contexts in which environmental decisions are made and new environments result". She defines the sustainable imaginary as "a society's understanding and vision of how resources are being used and should be used to ensure socio-environmental reproduction" (Cidell, 2017, p. 170). While a sustainable imaginary is necessarily context-specific, considering the specific resources used by a specific group at a specific place in a specific time, it is, at the same time, in close relation with the broad sustainability definition (Cidell, 2017). The latter is seen in Vaughter and Alsop (2017)'s work where they explore sustainability imaginaries within an institution that identifies four different sustainability imaginaries as, i.e. performance, governance, techno-efficiency, and community organising. In addition, the definition of the sustainability imaginaries is open-ended "since 'sustainable' implies a future temporal component" (Cidell, 2017, p. 171). With reference to the example of Chicago's green rooftops, she also shows that sustainable imaginaries transform over time in parallel with changing internal and external conditions (Cidell, 2017).

3. Contextual settings

3.1. Sustainable development in Bosnia and Herzegovina

In post-war-Bosnia and Herzegovina, sustainable development has become an important strategy that is strongly supported by the World Bank and the European Union (EU) in the economic transition from a socialist to a market-oriented economy (EU, 2018; Pugh, 2005; World Bank, 2017a). The World Bank and EU have, for example, given technical support in addition to policy advice for renewable energy generation – mainly hydropower, wind and solar power (BiH, 2016a; World Bank, 2016). An example of this is seen in the National Renewable Action Plan of Bosnia and Herzegovina where the terms of renewable energy generation are defined according to the EU sustainable development directives (BiH, 2016a). In fact, Bosnia and Herzegovina is to a large extent forced to comply with sustainable development plans in order to become a member of the EU, something which is strongly desired (BiH, 2015b; EUROSTAT, 2019). That Bosnia and Herzegovina takes this seriously is seen in their revision of laws as well as the introduction of new ones to initiate this transition towards a market economy based in part on sustainable development (Tzifakis & Tsardanidis, 2006). A good example is the Law on Renewable Energy Sources and Cogeneration in Federation of Bosnia and Herzegovina in which the use of renewable energy for transport, cooling and heating is promoted while the necessary regulatory framework for the technical infrastructure is also provided (FBiH, 2013).

Hydropower plays an important role in the sustainable development strategy of Bosnia and Herzegovina (BiH, 2011; Dogmus & Nielsen, 2020). Within Bosnia and Herzegovina, Elektroprivreda BiH, a joint-stock company (90% public and 10% private), is in charge of electricity generation and distribution (EPBiH, 2019). In addition, public-private partnership projects are highly encouraged especially in the hydropower sector (IRENA, 2017) and there are over 300 hydropower plants currently planned in Bosnia and Herzegovina (Dogmus & Nielsen, 2019; Riverwatch & EuroNatur, 2018a). Two of these are in the study village Martin Brod, one on the Una River (a small hydropower plant, 1.3 MW) and another is on the Unac River (a large hydropower plant, 72 MW). Hydropower generation is perceived as sustainable development in Bosnia and Herzegovina because of the country's large technical hydropower potential (6110 MW; IRENA, 2017) and familiarity with the sector since the time of Socialist

Federal Republic of Yugoslavia (hereafter Yugoslavia; 1945–92) (Chattopadhyay et al., 2017; EU, 2017). A point clearly visible in the policies focusing on this sector.

In addition to renewable energy generation, promoting ecotourism (UN, 2007) is another force driving sustainable development in Bosnia and Herzegovina (Smajic, 2019). This is seen in projects such as the Project for Sustainable Regional Development through Eco-Tourism (IJCA, 2009) and Ecotourism in Livanjsko and Surroundings (UNDP, 2012). Ecotourism as a sustainable development strategy in Bosnia and Herzegovina is important as it generates income by attracting tourists interested in the richness of biodiversity and the diversity of cultural destinations found in Bosnia and Herzegovina (BiH, 2015a; Smajic, 2019). Consequently, ecotourism is advocated and supported all over the country and encouraged by the EU (Čolaković, 2019). In particular, and as we shall see in our study village, national parks have been established to foster this sector.

3.2. Study area

Martin Brod village is within the Una-Sana Canton and is administratively under the rule of the Federation of Bosnia and Herzegovina (Figure 4-1). The village is within the borders of the UNP that was established in 2008 and operationalised in 2011. The village belongs to the Municipality of Bihać and the population of Martin Brod is predominantly Serbian with some Croats and one Bosniak summer resident.

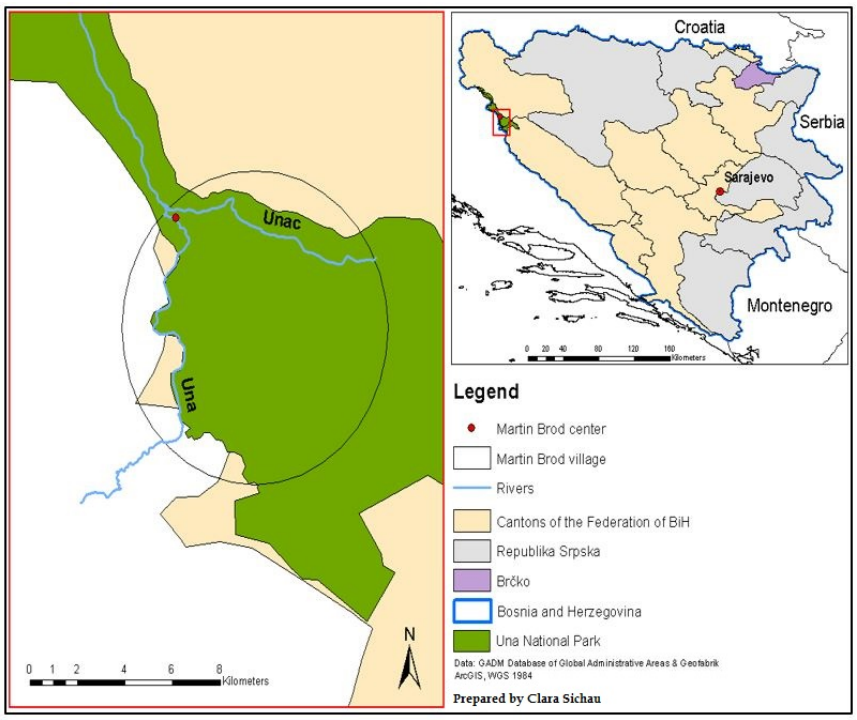

Figure 4-1 The location of Martin Brod village

Before World War II (1939–45), Martin Brod was famous for its watermills which used to be the main source of income in the village until the 1960s. The rivers Una and Unac, in addition to several connected creeks, flow through the village. There are numerous waterfalls in and around the village making the velocity of the water flow relatively high (Spahić et al., 2014). There is no scientific study for the exact number, yet the inhabitants interviewed claimed that the total number of waterfalls in the village was more than 100. In the 1970s, a mini-

hydropower power plant (with 0.06 megawatts installed capacity) started to generate electricity for the village. This led to a local modernisation period, for instance, a movie theatre was established in the village. In addition, during the time of Yugoslavia, an international railway station in Martin Brod created employment opportunities. However, in 1992, the outbreak of the Bosnian War caused the residents to flee. After the war, less than half of the original inhabitants returned and those were mostly the elderly people. The primary reason for this was the lack of employment opportunities in the village after the war as the railway station and the public utilities together with the mini-hydropower plant were permanently closed. During the immediate post-war era, renting rooms and providing food and service to fly-fishers became the main income sources in the village. However, in 2011, the UNP prohibited the release of non-native fish species into the rivers within the park's territory due to nature conservation policies.

According to the fieldwork results, the total number of permanent residents in Martin Brod was 76 in 2017. There were 38 permanent households. The average household size was 2. There were 11 residents under the age of 18; 41 between ages 18 and 64; and 24 above the age of 64. The average age was 52 and the distribution of males and females were equal. The education profile of the inhabitants was relatively high with 29 high-school and 11 university graduates.

Retirement payments constitute the only annual income source for 47.1% of the households. One household lives off farming, while the members of other households were seasonally employed in the UNP or *kafana* (the Bosniak/Serbian/Croatian name for the place which is a mix of a café, restaurant, and bar) in the village. Three *kafana*, two hotels, one fish farm, one primary school, one village medical clinic and the UNP created employment opportunities for 10 of the inhabitants and 6 of these were seasonal workers (employed only during the summer). The owner of the fish farm and almost all of the employees are from outside the village. 52.9% of the households' average monthly income was less than 400 BAM (≈205 Euro) whereas the minimum monthly wage is between 168–193 Euro in Federation of Bosnia and Herzegovina (Obradović, Jusić, & Oruč, 2019). 29 out of 38 of the households did not have any savings. 77% of the households interviewed stated having economic difficulties mostly due to insufficient income, lack of employment opportunities, and political instability. There were seven inhabitants who had been looking for a job for more than a year.

This indicates that the socio-economic status of the inhabitants is low and this was also expressed when people were asked to scale the quality of life in the village from 1 (very bad) to 5 (very good). In the survey, 67.6% of the respondents scaled 3 (average) and below. 16 of the respondents believed that life would be better for them in another country giving better employment opportunities there as an explanation. The majority of those who could not imagine themselves living somewhere else (n=18) were elderly (over 65 years old). The main reasons for this were a close personal attachment to the village and its natural surrounding. Only 11 out of 35 respondents were optimistic about their future. This low level of optimism was largely related to mistrust of politicians and government officials and the challenges of various forms of corruption (n=20).

4. Methods

This paper draws on primary and secondary data sources collected by the first author during fieldwork carried out in Martin Brod village and the cities of Bihać, Banja Luka, Sarajevo, and Mostar in Bosnia and Herzegovina between July and October, 2016 (3.5 months; Phase 1) and

July–August, 2017 (1.5 months; Phase 2). Martin Brod was selected as the case study village as it was considered to be exemplary for how sustainable development strategies play out in Bosnia and Herzegovina.

Primary data was collected using methods such as semi-structured interviews, participant observation, informal talks, and household surveys which also included open-ended questions. 30 out of 65 semi-structured interviews were conducted with inhabitants of Martin Brod village, where the first author lived for the majority of the five months spent in Bosnia and Herzegovina. Since the number of summer residents (21 households) doubles the population of the village, interviews were conducted with summer residents as well. The remaining 35 semi-structured interviews were conducted with bureaucrats, decision-makers, UNP staff, water concession commission heads, hydropower sector experts, donors, consultants, investors, and officials at development agencies, water agencies, international financial institutions, hydropower associations and civil society organizations. Because Martin Brod belongs to the Municipality of Bihać, therefore of the Una-Sana Canton in the Federation of Bosnia and Herzegovina, interviewed officials were generally selected from the following administrative hierarchy.

Two different types of sampling strategies have been used when selecting interview respondents in the village and for the rest of the respondents. In the village, snowball sampling, which indicates "a study sample through referrals made among people who share or know of others who possess some characteristics that are of research interest" (Biernacki & Waldorf, 1981, p. 141), was used. This was to collect data related to the recent past, when there was active opposition to hydropower plants in the village, and to understand the inhabitants' opinions of hydropower plants and the national park. When snowballing, equal distribution of gender and age criteria was looked out. For participant recruitment in the village, permanent and temporary residents were listed carefully according to their household composition, gender and age range with the support of the village head. The majority of the interviews conducted with the local inhabitants took place during Phase 1. Purposive sampling was preferred for selecting other respondents, such as decisionmakers, civil society organisations, and public officers, considering that they "may have a unique, different or important perspective on the phenomenon in question" as well as to ensure their presence in the sample (O. C. Robinson, 2014, p. 32). For participant recruitment, a specific respondent was selected to be interviewed or was approached to ask for a referral for another respondent who could fit the criteria. Most of those interviews were conducted during Phase 2. A list of respondents can be found in Appendix 1.

57 of the interviews were conducted in Bosnian, Serbian or Croatian with the assistance of two translators. Eight of them were conducted in English. Most interviews took between one and two hours and were recorded by a voice recorder with the consent of the respondents. The rest were transcribed during and/or immediately after the interviews. In addition, 34 household surveys were conducted with the permanent residents of Martin Brod, providing almost a total coverage of the permanent households in the village (N=38). Temporary households were not selected as survey participants due to the fact that their livelihoods were not dependent on village sources as they spend more than six months in a year outside of the village.

Secondary data was collected from official statistics, technical reports, government documents, civil society reports, historical documents, EU policy documents, the Bosnia and Herzegovina state, entity level and cantonal policies, newspaper articles, personal communications, and websites related to the hydropower sector. When necessary, if the text was in

Bosnian/Serbian/Croatian, two research assistants translated them into English carefully. The reliance on translators implies that we might have lost or lacked the nuance of original meaning or significance. Because understanding the perception of the locals was the key aspect of this research, it is acknowledged that relying on translation, although carefully done, might possibly limit the direction of data analysis.

The qualitative data were analyzed using MAXQDA 2018, which allows systematizing, organizing, and analyzing non-numeric data in order to make connections between different components and aspects of the data collected (Flick, 2014). Axial coding, i.e. linking categories of codes, was accomplished using this software. For instance, two main categories of themes, i.e. hydropower plant and national park, were identified. Patterns and relationships between codes were identified accordingly. The analytical induction method – namely classifying word and phrase repetitions and, based on this, developing hypotheses – was used for the analysis of the qualitative data. These hypotheses were subsequently checked with informants in the field (Emerson, 1988). This allowed us to be able to identify the points where data was lacking and to update the list of potential respondents accordingly. In other words, triangulating the data in this way provided new insights that were checked in further interviews and in informal conversations with people encountered during the fieldwork. The quantitative data were analysed using IBM SPSS 22, which is used for statistical analysis. Simple program tools, such as identifying frequency and mean or cross-tabbing, were used in order to analyse the statistical data.

5. Results

5.1. Hydropower projects in Martin Brod

In 1968, geological examinations were conducted in the Unac Canyon for a large hydropower project. The permeable soil type found in the canyon and the low water capacity of the Una River during the summer season were deemed unsuitable, making this project physically and economically infeasible (RES29). Despite this, Elektroprivreda BiH revived the large hydropower project in the village in 2011. A joint energy investment company won the tendered contract but were subsequently not permitted to conduct the necessary environmental or geological studies by the Bosnia and Herzegovina Ministry of Environment and Tourism. Martin Brod is located in a nature area protected by Bosnia and Herzegovina law (BiH, 2013) and UNP law (BiH, 2008) which prevents the constructing of large hydropower plants.

Initially, the villagers believed the project was going to happen as they had not been informed otherwise, nor been involved in its planning. When they realized in 2011 that the project would not materialize they were, however, not surprised. The inhabitants' experience with hydropower plants in the post-war area goes back to 1998. Indeed the same actor, Elektroprivreda BiH, had then also invited private investors to consider building a small hydropower plant. This project went dormant, also for reasons unknown to the inhabitants, and the failure of the new project was thus "expected" as it was sometimes put by our informants. Yet this project resurfaced on 17 December 2014, when a Russian investor, who was introduced to the inhabitants at a community meeting only by the first name, visited the village in order to discuss the project.

This meeting was facilitated by the UNP management, took place in the youth centre and included a large number of the inhabitants. When the UNP management was confronted about

their role in this meeting, they claimed that the UNP was there only as a stakeholder and that they did not support the project. During the public participation meeting, that investor promised to employ 16 people permanently. However, people were sceptical about this, mainly because local experts had said, including to us in interviews, that a small hydropower plant such as the one proposed does not require that many employees. Furthermore, scepticism concerned the fact that a public tender had not taken place prior to the arrival of 'the Russian,' as he was referred to in the village. Growing increasingly suspicious, the inhabitants, with the help of local journalists, found out that he had only one company which was registered as being worth only USD 5,500. The project was estimated to cost € 2.3 million. The local officials present at the meeting stated afterwards to local reporters that they had not been informed about the details of the project and the investor. In fact, it was only the monk at the village monastery and another local who claimed to have ever seen the project map, something that apparently was revealed at a presentation in Bihać in 2015. During the fieldwork, we were also told that the project had already been assigned to a local investor when the Russian had visited the village.

5.2. Opposition towards the hydropower projects

The lack of transparency was a major reason for the widespread opposition to the hydropower projects in the village but opposition also focused on environmental protection. It was commonly argued that hydropower plants were unsustainable or destructive. Several respondents, for instance, talked about the micro-climate impact of hydropower plants. One respondent explained, that hydropower plants create so much mist that the sky would be covered with a permanent layer of fog that would result in less sunlight for crops (RES28). In fact, the inhabitants were deeply concerned about 'touching' the river as they called it: "No one should touch Una" was a popular slogan repeated in interviews. "Wouldn't it be a shame to destroy this kind of nature?" was a rhetorical question often posed to us during fieldwork. To the inhabitants, the construction of hydropower plants represented a threat to the undisturbed natural surroundings of the village.

Indeed the concerns of the Martin Brod inhabitants were mainly in relation to the natural park and its natural beauty. To them, this beauty should not be destroyed by dams also because such destruction hindered the potential future economic benefits of the park. One respondent, for instance, put it as such: "It would be better if this place stays as a natural park". When asked why, he responded, "because then people can live on ecotourism; good for both the people and the nature" (RES26). On numerous occasions, the inhabitants explained how they had expectations of socio-economic and environmental benefits from the UNP, i.e. employment and income from tourism next to environmental managements that hydropower plants would endanger.

Many villagers attended protests against the hydropower plants that were staged in front of the Bihać municipality building. Local and regional environmental activists and NGOs, in collaboration with some of the inhabitants, organised these protests and a petition campaign. The petition campaign targeted an annulment of the project and combined with other factors such as "the Russian"'s lack of capital and the UNP Law, it was successful. Two weeks after the largest protest, the municipality annulled the project. The main concern voiced at the demonstrations and in the petition mirrored what was said to us in interviews. The demonstration focused on environmental impacts, arguing that hydropower plants were unsustainable as they ruined both nature and economic opportunities.

5.3. The Una National Park fails to foster sustainable development

Before its establishment, the manager of the park project had promised that it would facilitate sustainable development in Martin Brod, meaning that economic activities would be based on environmental protection via the national park. Environmental management to preserve the natural beauty of Martin Brod, such as regular cleaning of the irrigation canals, the rivers and forest, maintaining the paths and roads, improving biodiversity, next to employment opportunities, such as rangers and an increased number of tourists, would generate income through accommodation and various other services for ecotourism. To many inhabitants, this all indeed represented sustainable development.

The hopes the inhabitants had for the national park as a source of sustainable development did, however, not materialize. From the perspective of environmental protection and management, the UNP had resulted in the protection of nature to some extent but it was not proper environmental management, in the eyes of the inhabitants. It was even argued that the management of the environment was worse than before the UNP was established. The environmental services that the UNP had promised, such as clearing water channels and collecting the garbage, were simply not delivered. During fieldwork, it was often observed how inhabitants were cleaning their own water channels without the help of the UNP staff. Also, there were accumulations of garbage around the park. The inhabitants thus felt that instead of the park cleaning up for them, they were cleaning up for the park. The condition of the bike paths that had been established in Martin Brod as part of a touristic attraction was poor and other facilities were not looked after properly. It was observed that the picnic benches, for instance, were tied up by the village head with a rope in order to secure against autumn floods to take them away. When asked the village head whether it was not the responsibility of the UNP management, he said:

> *The UNP management believes that they support ecotourism only by locating benches here and there in Martin Brod. How many times I told them that the inhabitants were unhappy and unsatisfied about what the UNP calls "environmental management". But the UNPs response to these complaints was that the locals should look after their own village as it was not the responsibility of the UNP.*

Except for a few inhabitants, who were hired by the UNP or were expecting to be hired soon, all the inhabitants had complaints about the UNP's bad environmental management program. When these complaints were shared with the UNP manager during an interview with him, he agreed that environmental management did not mean collecting garbage or supporting the locals for ecotourism. He was certain that he did enough by establishing the UNP that already attracted more tourists than before. However, as argued by the inhabitants, the number of tourists staying overnight did not increase. Thus, those who had reorganised and refurnished their places to accommodate overnight-tourists with bank loans were now having difficulties honouring these loans.

The inhabitants were frustrated with the fact that the UNP was making a profit, which was confirmed by the UNP manager, yet they have not experienced any "sustainable development" up until then. "There are only restrictions and we have no gain out of that", a survey respondent summarised the reason for frustration. High taxes and standards of accommodation, tours, and tour guides were often mentioned as concerns in this line by the inhabitants. High standards were particularly problematic as it made unregistered ecotourism business impossible which

used to bring income for at least ten households during the summer season. Moreover, no official financial support for the establishment of officially licensed businesses was available making ecotourism practically impossible. The high standards and the need to officially registered businesses, the UNP policies, contrary to what was initially promised, limited other income opportunities for the inhabitants. For instance, the UNP prohibited fly-fishing within the vicinity of the village due to ecological concerns. This, according to the inhabitants, dramatically decreased the number of fly-fishers, resulting in less income for the village. This also had an influence on the inhabitants as many used to fish but now they could no longer do so. The employment of park rangers was another major concern for the inhabitants. It quickly became clear that the UNP was employing rangers who mostly did not reside in the village. The frustration over this was voiced by a local respondent in an interview that explained how the UNP employed people who were not residents of Martin Brod, even employing fewer people than written in the official budget "in order to syphon off the rest of the money" (SurveyRES4).

On top of all, the attitude of the UNP management was observed being top-down. The manager, during the two interviews conducted with him, claimed that he was the "manager of the inhabitants", not only of the UNP, and that he stated that he knew what was the best for them. When he was confronted with the complaints of the inhabitants, he criticised them for having no vision. When explaining his future plans for Martin Brod, he said he had plans for charging from the entrance of the village.

5.4. Support for the hydropower projects

After losing hope regarding the sustainable developments promised by the UNP, the Martin Brod inhabitants started to consider hydropower plants as an alternative for development. Many inhabitants said that even if the hydropower plants might have some negative impacts they would not be as severe as the activists had claimed during the protests and petition campaign against hydropower construction in the village. This point even triggered anger for many inhabitants towards activists who were now seen as having been ignorant of the socio-economic reality of the village. One respondent, who had been against building hydropower plants in the village in 2015, now said "I do not like when activists speak on behalf of us. I can decide on my own behalf. Activists make me really angry when they say they are against hydropower projects in Martin Brod without even asking our opinion" (RES12).

Interestingly, the discussions of the hydropower plants during this period emphasised that the environmental impacts of these projects were uncertain or low. The mini-hydropower plant was, for example, now argued to have zero negative environmental impact and to be environmentally friendly as it did not have any impact on climate or river flow. The level of support for the large hydropower project was more ambiguous, nevertheless, the proponents of hydropower plants claimed that the environmental impacts would be very low: "The large hydropower project is renewable but [if it is built] there will be some change in, for instance, flora and fauna. The level of water will decrease. I am not sure if it would have any major impact though" (RES27). Another respondent said "People are saying this would happen, that would happen. I don't think there will be any impact [of the large hydropower plant]. People are afraid that the dam will break and it will cause floods but the amount of water is not enough for this to happen" (RES11). Support for the hydropower plants was also related to technology. It was believed by many villagers, including some previously against these projects, that there had been sufficient technological advances in the intervening years that hydropower plants

could now be constructed and run in a sustainable manner, as it was often put. In general, the opinions of many locals changed about hydropower plants from being unsustainable to being sustainable. One interviewed local said, for instance, that it was ok for her to have one or more hydropower plants on the creek where she got her clean water. Claiming that hydropower plants do not have environmental impacts on this, she added "Martin Brod will preserve its natural beauty while we could generate our own electricity as it used to be in the old times. Thus, Martin Brod could stand on its own feet again" (RES44).

In addition to being environment-friendly, the inhabitants expected economic benefits from hydropower projects. Using the mini-hydropower plant constructed in the 1970s that was operational until the war broke out as an example, proponents argued that Martin Brod was then more modern and economically more developed largely due to this hydropower plant. Thus, they argued that, if planned properly, hydropower plants could bring similar (or even more) benefits to them. The foreseen economic benefits of the projects were closely related to the possibility of being employed constructing and running dams and selling land affected by them. Moreover, several respondents claimed that a hydropower reservoir would create a "softer climate" meaning one that is milder and more attractive for tourists.

Indeed, almost all respondents agreed that they were ready to do whatever was necessary to return Martin Brod to its "good days" before the Bosnian War. One respondent clearly expressed this and exemplified at the same time how the failed UNP sustainable development promises and the support for hydropower were intimately connected in the village: "before, I was saying that they shouldn't build hydropower plants in Martin Brod and that the UNP was a better option for sustainable development. But the UNP did not do any good for us. It did not do any good for the environment either" (RES34). This, in return, visibly influenced inhabitants' positions towards hydropower plants and they began acting accordingly. One inhabitant running in a local election included these plans in his election campaign and promised that hydropower plants would bring environmentally and economically "sustainable development" to his fellow villagers. He argued that now it was time for Martin Brod's inhabitants themselves to decide what is good for them, demonstrating the changing attitude towards the hydropower projects was a step in this direction. He was supported by the monk in the village who argued that the candidate was to be "the last train for Martin Brod". He, along with other villagers interviewed, now claimed that these hydropower plants could contribute to the sustainable development of Bosnia and Herzegovina generating renewable energy and preserving the natural beauty of Martin Brod simultaneously.

6. Discussion

Increasing climate change concerns and environmental problems have driven scientists and decision-makers to pay more attention to the concept of sustainability especially over the last four decades (Schröter et al., 2017). The prominent international use of the concept of "sustainability" raises concerns with regard to its meaning, largely because the definition of sustainability is flexible, i.e. context-dependent, and it is often based on who defines, uses, or applies it (Bell & Morse, 2018). Concerns among researchers and decision-makers regarding this flexibility are also related to how the term is easily misused (Hák et al., 2016; Kuhlman & Farrington, 2010; Miller, 2007). Various studies of greenwashing demonstrate this (e.g. R. Dahl, 2010; Delmas & Burbano, 2011; Laufer, 2003). The development of sustainability

indicators exemplifies the attempt to curb the opaque nature and subsequent flexibility of sustainability concept (Miller, 2007; Pintér et al., 2012).

We acknowledge the importance of avoiding greenwashing and other misuses of the concept of sustainability but we argue, following other researchers (Bell & Morse, 2003, 2008), that the movement towards determined definitions and measurements, that is seen in, for example, the development of sustainability indicators, can have negative consequences. It might simplify social values as numbers, or, attempt to measure and define the immeasurable (see also Dong & Hauschild, 2017; Hák et al., 2016; Sala, Ciuffo, & Nijkamp, 2015), but our major point is that determining the term limits not only the possibilities of the powerful for its misuse but also might restrict the potential for the less powerful to express themselves when the conditions change, i.e. to have agency. The flexibility of the term allows the less powerful group, our results show, to use the term to decide what is sustainable and what is not to them. Hence, if sustainability becomes strictly defined and if decisions are made according to this definition, there is little room for sustainability imaginaries. This, we argue, would limit the option especially for the less powerful to express their voice supported by reference to sustainability, leading, in turn, to disempowerment (Klugman & World Bank, 2014). Keeping the term sustainability flexible and integrative allows in other words changing sustainability imaginaries. Imaginaries that can be adjusted according to changing conditions as was seen in our data.

Indeed, in Martin Brod, the locals redefined what projects were sustainable over a few years, and used this redefinition to mobilise support for the national park and against the hydropower plants, and vice versa. Initially, it was hoped that the park would bring sustainable development, but the park was later critiqued for not doing so. Hence, the hydropower plants that were previously seen as destroying the environment were now seen as providing renewable energy and sustainable development. This redefinition was closely related to the socio-economic situation in the village and, as such, the application of sustainability to projects otherwise deemed unsustainable by the villagers was a clear attempt by them to improve their economic situation.

In this way, the Martin Brod inhabitants' reference to and use of sustainability closely resembles the insights concerning imaginaries. Imaginaries are various (C. Taylor, 2004). When the conditions changed concerning the park, for example, the sustainability imaginaries amongst the villagers transformed (Cidell, 2017; M. Nielsen & Pedersen, 2015). As such, the villagers judged the sustainability of the projects less in terms of predefined notions or frameworks, because at the level of the state, both of those projects were considered sustainable for Martin Brod, but rather on experienced situations. Indeed, it was these, combined with expectations of the benefits of the projects, that shaped what they termed sustainable, namely that with a capacity to enhance their socio-economic conditions while being environment-friendly. While, at the level of the decisionmaking, both projects are sustainable, the flexibility of the term made it possible for the inhabitants to both experience the projects as sustainable or unsustainable as well as to mobilise support for and against these projects based on imaginaries.

Limiting and framing the meaning of sustainability, i.e. drawing a line in the sand between what is sustainable and what is not (C. Taylor, 2004) or "squaring the circle" according to J. Robinson (2004), would therefore not necessarily make sense in Martin Brod or at least would not be advantageous to the inhabitants. It would also not be integrative as it would take away the inhabitants' ability to decide for themselves what sustainability is and should be. This is a point

an increasing number of scholars and decision-makers support by attempting to involve local stakeholders when developing local definitions and indicators of sustainability (e.g. Magee et al., 2013; Reed et al., 2008). Inclusion would here help overcome the problem of over-simplification and exclusion that overly narrow definitions might result in (Rigolot, 2018). While attempting to answer what is to be sustained, when and why (Garrett & Latawiec, 2015), the potential of an open-ended nature of sustainability imaginaries should therefore not be overlooked (Cidell, 2017). Moreover, sustainability imaginaries are not only context-specific in terms of existing material conditions but are also temporal due to changing external conditions. Attempts to limit those imaginaries not only eliminate the representation of diversity but therefore also of temporality, a point clearly illustrated by our data.

Hence, the flexibility of the term sustainability is crucial for the inhabitants of Martin Brod and, potentially, elsewhere (e.g. Epstein & Buhovac, 2010; Kleine & von Hauff, 2009; Laws et al., 2004). It opens space for the representation of dynamic and contested sustainability imaginaries involving many people in the conversation "in a world in which there exist multiple conflicting values, moral positions and belief systems that speak to the issue of sustainability" (J. Robinson, 2004). Moreover, this understanding is more in line with an understanding of sustainability as a dynamic and stochastic system (Hansen & Jones, 1996, p. 200) and "[i]f sustainability is to mean anything, it must act as an integrating" rather than being an excluding concept (J. Robinson, 2004, p. 378).

7. Conclusion

Sustainability is a widely used term, yet its meaning is vague. The slippery nature and diverse use of the term have been a hot topic among sustainability researchers for decades. Researchers concerned with the misuse of the term have tried to determine it using, for example, indicators. This has in turn been criticised by other researchers who claim that strict framings cannot be representative as society is dynamic and complex. In this paper, we acknowledge the concerns of the former group of researchers but we also question attempts to determine and define the term. Our case study showed that local disempowered stakeholders could benefit from the flexibility of the term which gives a voice to them in order to represent their changing sustainability imaginaries hence allow them to have agency. We argued thus that determining the term limits the potential of local stakeholders to empower themselves. Caution regarding current attempts to better define and settle on what is sustainable and how to measure this is therefore raised and we suggest that the flexibility of the term "sustainability" is not always problematic but might even be beneficial in some circumstances. This was at least the case in the Martin Brod village in Bosnia and Herzegovina. Moreover, it is necessary to take into consideration consequences of all aspects of sustainability in a holistic way, i.e. geospatially, socially, economically, which emerge from the selected approach to sustainability, such as social sustainability, environmental sustainability, and economic sustainability.

Chapter 5 - Synthesis

1. Conclusion

This thesis aims to expand our understanding of the so-called hydropower boom that is mostly observed in transition and developing countries. Many of these hydropower plans remain on paper, yet the literature has largely overlooked this fact, focusing rather on the benefits or negative impacts of the hydropower projects. In this thesis, BiH was selected as the case study country because, as a part of the country's sustainable development strategy, more than 300 hydropower plants are planned yet only a small number of these have been built so far. In order to fill the gap in the literature and expand our understanding of the hydropower boom, it is important to understand whether the hydropower boom is taking place and if not, which circumstances have generated the on-paper hydropower boom. What motivates hydropower and hydropower investors in this light, which actors benefit, what kind of results are observed or can be expected?

I used the case study approach to explore the hydropower boom in BiH from three angles: statistical, administrative, and geographical. Approaching the case statistically allowed me to discover whether the hydropower boom is actually taking place in BiH. From the administrative one, I could explore similarities and differences across different administrative levels in the country, i.e. village, canton, federal state, and national state, most of which are either semi-autonomous or autonomous, in terms of planning, management, and decision-making. A geographical approach to the case enabled me to see how different geographical units experience the same phenomenon by discovering their similarities and differences. I used to these differences to reflect upon the global hydropower boom. Moreover, using qualitative research methods, such as semi-structured interviews, participant observation, as well as household surveys, enriched my understanding of the case, and, in particular, how various actors understand and use the sector. Collecting data from various stakeholders, such as decision-makers, civil society organisations, public officers, and local inhabitants, at different administrative levels and geographical locations, gave me a representative and broad understanding. Additionally, interviews, informal talks, and participant observation conducted during my stay in Martin Brod allowed me to have an in-depth understanding of a village experiencing the boom. Exploring the inhabitants' relationship with nature, decision-makers and the national park management, life satisfaction, their changing socioeconomic conditions and imaginaries, their perception concerning corruption, sustainable development, hydropower plants, the national park, socio-political and socio-economic conditions, and water management, gave me good insights into how these are all interrelated and play out in connection with hydropower.

There are three notable conclusions of this thesis. These are highlighted in the three main chapters. First, Chapter II clarifies that the hydropower boom might not be taking place to the extent foreseen. It explores the reasons why this is so in BiH, to some extent in South-East Europe and potentially in other countries with similar conditions across the world. Second, and as described in Chapter III, small size projects increase the risk of corruption. It was shown why and how small projects are used to benefit from the sustainable development discourse channelling money. Also, the hydropower bureaucracy and the administrative complexity in BiH enabled corruption in connection to smaller projects. Moreover, centring the administrative and scholarly attention only on large unbuilt projects creates a safe space for corrupt actors, obscuring corruption that exists in small projects. Chapter IV shows that the Martin Brod inhabitants have a flexible definition of sustainability from which they benefit. When external

conditions changed so did the local inhabitants' ideas about hydropower. Thus, using the flexibility of the term "sustainability" provides advantages for disempowered peoples.

These results are significant for the hydropower and sustainability literature in three ways. First, this thesis showed that the on-paper hydropower boom still has consequences. Therefore, it is important to understand the hydropower boom despite the lack of actual construction of hydropower plants. The connection between on-paper plants and corruption is the second main result and highlights the importance of the first result. Consequently, and third, the close connection between hydropower and sustainable development needs to be carefully considered in light of the first two results. Here the answer to the question of who benefits from sustainability discourses is shown to be twofold, as corrupt actors and local disempowered people both benefit. This has implications for how strictly we want to define the term "sustainability." This conundrum should be further explored. This thesis therefore contributes learning from the unsuccessful sustainable development projects.

2. Limitations and future outlook

Despite these insights, it is important to acknowledge the limitations of this research. First, even though the interpretations were done carefully by the two research assistants, I recognise that there might be some information that was "lost in translation." However, this is the case for any research done in a language that is not the mother tongue of the researcher. A second limitation of this research is that almost one third of the interviews conducted with officials were devoted to understanding the complicated administrative structure of the country and of the hydropower business. This left respondents with limited time to discuss other research topics. Third, collecting data on corruption is difficult although in BiH respondents were generally willing to talk about this topic. However, it was not possible to access concrete details such as when, where, the amount of money, how it took place, and who was involved. Even in the few cases that such information was given, I preferred to keep it anonymous due to ethical concerns.

More research on the hydropower boom is necessary. One future research objective could be to conduct a more in-depth exploration of the perspective of hydropower investors holding hydropower concessions. It is valuable to understand how these investors see the on-paper hydropower boom. Do they consider their investments as dead, what kind of alternatives are considered by the hydropower lobby, and what are their perceptions of sustainability? Another future research objective could be the exploration of other cases around the world. For example, China could be a good case. There, a hydropower boom in terms of planning is clearly observed, however the number of constructed projects is quite low in comparison to the number of planned projects. This might be the case in many other places. Essentially, not enough is known about this. Another future research objective could focus on understanding the connection between climate change and the increasing number of hydropower investments. An increasing number of researchers argue that climate change would severely affect the productivity of hydropower generation due to factors like changes in rainfall trends. What does this mean for concession holders of both materialised and unbuilt projects? Moreover, future research is still needed in order to better understand the connection between hydropower and the financialisaton of water. Could all these hydropower concessions, including those on-paper, lead to future water grabbing?

A future outlook specific to the BiH case could be the exploration of the profile of foreign investors and their investment motivations. For example, the number of Chinese investors is increasing in BiH and their projects are often exempt from internationally acknowledged social and environmental impact assessment regulations because Chinese investors bring their own funding. Their investments might therefore have a different profile than those presented in this thesis. Moreover, the number of Arab investors is increasing in BiH and they are not interested in hydropower investments but rather in other water-related investments. They invest in lands where there is a natural water source. This could be a critical topic in terms of water rights. Another future research objective could be the exploration and mapping of how different actors in the country define sustainability. This could help reveal conflicting interests and potential areas of agreement.

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Appendices

Appendix 1: The list of interviews and interviewees

Number of interviews	Number of interviewees	Interviewees	Category
30	34	Martin Brod village inhabitants	Local
2	1	The Martin Brod village head	Decision maker and local
2	1	The Una National Park manager	Decision maker
1	1	A Slovenian kayaker, biologist, and activist	Activist
1	2	Rangers of the Una National Park	Decision maker and local
1	1	An IFC legal specialist on hydropower projects in Bosnia and Herzegovina	Financer
1	1	The *Kreditanstalt für* Wiederaufbau (Reconstruction Credit Institute) principal project manager on hydropower investments in Bosnia and Herzegovina	Financer
1	1	The Minister of Urban Planning and Environment of the Una-Sana Canton (USK)	Bureaucrat
1	1	An expert on hydropower investments in the USK Ministry of Urban Planning and Environment	Expert
1	3	The Minister of the Agriculture, Water Management and Forestry of the USK and two experts from the ministry	Bureaucrat
1	1	The director of an environmental consultancy company in Bihać	Consultant
1	1	The Mayor of Bihać municipality	Decision maker
1	1	A development expert in the Municipality of Bihać	Expert
1	1	A water concession expert in the USK Ministry of Agriculture, Water Management and Forestry	Expert
1	1	The owner of the fish farm in the Martin Brod village	Local investor
1	1	The head of the Concession Commission of BiH	Concession commissioner
1	1	An expert in the Concession Commission of RS	Concession commissioner and expert
1	1	An activist and the director of the Centre for Environment (a regional environmental NGO)	Activist
1	1	The director of the Hydro-engineering Institute Sarajevo	Consultant and expert
1	1	A bidding expert in a partially-public energy investment company	Investor and expert
1	1	An activist and a member of *Eko Akcija* (a regional environmental NGO)	Activist
1	1	The assistant minister in the Environment Department of the FBiH Ministry of Environment and Tourism	Bureaucrat
1	1	The assistant minister in the Energy Department of the BiH Ministry of Foreign Trade and Economic Relations	Bureaucrat
1	1	An expert in the water sector in the FBiH Ministry of Agriculture, Water Management and Forestry	Expert and part the of decision-making mechanism
1	1	The head of the Environmental Permit Department of the FBiH Ministry of Environment and Tourism	Decision maker
1	1	An expert in the *Heinrich Böll Stiftung* (a German-based environmental NGO)	Activist
1	1	A volunteer, investor and the secretariat of the Association of Renewable Energy Producers in BiH	Investor
1	1	An expert in the German Corporation for International Cooperation	Financer
1	1	An expert in the Elektroprivreda BiH	Expert and investor
1	2	Two experts in the USAID Environmental Impact Assessment Project	Donor and financer

Number of interviews	Number of interviewees	Interviewees	Category
1	3	The director and two experts in the Water Agency of the Sava River Basin	Water agency expert
1	1	The director of the Water Agency of the Adriatic Sea	Water agency expert
1	1	An expert in the FBiH Ministry of Energy, Mining and Industry	Expert and bureaucrat
1	1	The head of the Concession Commission of FBiH	Concession commissioner
65	**73**	**TOTAL**	**-**

Appendix 2: The guide for semi-structured interviews

- If local,
  - demographic information,
  - life in the village and a day in the village,
  - life during and after the war,
  - opinion on politics and politicians in the country,
  - life in the National Park,
  - advantages/disadvantages of the establishment of the National Park,
  - problems of the village,
  - satisfaction about life in general and in the village,
  - future plans,
  - relations over the share of water resources,
  - socio-economic perception over water resources (for instance, is it a public or private good?),
  - general thoughts on sustainable development and hydropower development in BiH,
- If bureaucrat, decision-makeraker, expert, consultant, or water agency officer,
  - thoughts on sustainable development;
    - What is sustainable development?
    - What is your role on this path?
    - What should be done more/less?
    - Progress in terms of fulfilling the goals
  - thoughts on the hydropower development in BiH,
  - detailed information and thoughts on the hydropower plant plans in the relevant administrative unity,
    - the number of existing and planned projects in the responsible administrative unit, i.e. canton, entity, or state,
    - profiles of investors, financers, etc.,
    - the extent of public participation and of the role of public,
    - regulations, rules, laws, etc.,
    - problems related to the sector,
    - investigation mechanism,
  - sociopolitical profile of the country/entity/canton,
  - thoughts on socio-economicomic situation of the country/entity/canton,
- If donor, financer, and/or investor,
  - thoughts on sustainable development, questions like
    - What is sustainable development?
    - What is your role on this path?
    - What should be done more?
    - Anything could be done less?
    - Role of hydropower development, etc.
  - thoughts on the hydropower development in BiH,
  - sociopolitical profile of the country/entity/canton,
  - benefits of the hydropower development plans in BiH,
  - problems faced in the sector,
  - the extent of public participation and of the role of public,

- If activist and/or civil society organisation,
    - thoughts on sustainable development, questions like
        - What is sustainable development?
        - What is your role on this path?
        - What should be done more?
        - Anything could be done less?
        - Role of hydropower development, etc.
    - thoughts on the hydropower development in BiH,
        - the number of existing and planned projects in the responsible administrative unit, i.e. canton, entity, or state,
        - profiles of investors, financers, etc.,
        - the extent of public participation and of the role of public,
        - regulations, rules, laws, etc.,
        - problems related to the sector, and
        - investigation mechanism.

Appendix 3: Household questionnaire

A: HOUSEHOLD

A1. Number of household members:

	Household members	Gender	Age	Marital status	Permanent residence	Educational background	Main occupation	Monthly allowance	Annual allowance (KM) (only ask if monthly allowance doesn't exist)
	1 Household head 2 Wife/husband 3 Son/daughter 4 Mother/father 5 Mother/father-in-law 6 Brother/sister 7 Son/daughter-in-law 8 Grandson/daughter 9 Other....	1 Female 2 Male		1 Married 2 Single 3 Divorced 4 Widow 5 Other....	1 Inside the village 2 Outside the village 3 Both 4 Other	1 Illiterate 2 Only literate 3 Primary school 4 Secondary school 5 High school 6 College 7 University 8 Master's 9 Preschool 10 Other 11 NA	1 Farmer 2 Craftsman 3 Merchant 4 Civil servant 5 Worker 6 Seasonal worker 7 Apiarist 8 Breeder if not... 8 Retired 9 Unemployed 10 Housewife 11 Student 12 Old 13Handicapped 14 Other....	1. 0 2. 1-250 3. 251-500 4. 501-750 5. 751-1000 6. 1001-1300 7. 1301-2000 8. 2001-2500 9. 2501-3000 10. 3001 and above 11. No monthly allowance (annual) 12. No regular income 13. NA	1. 0 2. 1-2000 3. 2001-4000 4. 4001-6000 5. 6001-8000 6. 8001-10000 7. 10001-12000 8. 12001-14000 9. 14001-15600 10. 156001 and above 11. NA
(A1)	**(A2)**	**(A3)**	**(A4)**	**(A5)**	**(A6)**	**(A7)**	**(A8)**	**(A9)**	**(A10)**
01									
02									
03									
04									

B: SETTLEMENT

B1-1. How long have you been living in this village?

(1) Since birth (go to **B2**)
(2) ..... (ask **B1-2** or **B1-3**)

B1-2. If you come here from outside the village,

B1-2-1. From where?..... **B1-2-2.**When? .....

B1-2-3. Why?.....

B1-3. If you **left this village for a period of time** in the past:

B1-3-1. For how long? .....

B1-3-2. Between/in the year(s) .....

B1-3-3. Where did you go? .....

B1-3-4. Why?.....

B2. What is your **house's (in the village) legal status**?

(1) Family-owned
(2) Used without certificate of inheritance: From……. and has…… sharers
(3) Rented
(4) Used free of charge
(5) Land is registered but not the house
(6) Other……..

B3. Since when are you living in this house? Since (year)…….

B4. When was the last time you **renewed** your house?

(1) Never

(2) ……

B5-1. Do you spend time outside of the village yearly?

(1) Yes → For how long?.....
Where?..... (ask **B5-2 & B5-3**)
(2) No (go to **C1**)

B6-1. What is the legal status of this house?

(1) Family-owned
(2) Used without certificate of inheritance: From……. and has…… sharers
(3) Rented
(4) Used free of charge
(5) Stays in a relative's house with the landowner
(6) Other……..

C: ECONOMY

C1. What are/was your **main sources of (household) income**? (Ranking)

Rank	C1-1.Currently	C1-2.Five (5) years ago
1		
2		
3		
4		

C2. How much are/were you **dependent on the market** regarding your domestic food consumption?

C2-1.Currently	None	Not much	Average	More than average	Very much
C2-2.Five (5) years ago	None	Not much	Average	More than average	Very much

C3. Monthly expenditures

lower (1), the same (2), or higher (3)	C3-1.Currently	C3-2.Five (5) years ago it was
Food		
Water usage		
Heating and cooking		
Transportation		
Others		

D: AGRICULTURE

D1. What are your **main agricultural products**? (Ranking) And, **to whom** do you sell these products?

	D1-1.Currently	D1-2. Five (5) years ago	D1-3. Purchaser (now)
1			
2			
3			

D2. Do you have **agricultural insurance?**

(1) Yes
(2) No → Why?.....

D3. When was the most productive year for agriculture as far as you remember?.....

E: APICULTURE

E1. How many **hives** and **approximately** how many **bees** do you have?

……..hives and ……bees

E2-1. How much honey do you produce per year?

…….kg

E2-2. How much honey did you produce **five years ago**?

…….kg

E3. Who are your customers? (Ranking)

1

2

3

E4-1. Are you an **itinerant beekeeper**?

(1) Yes (2) No (3) Time to time (if it's time to time ask **E4-2**)

E4-2. Explain (why, period, where do you go etc.)

E5. When was the most productive year for apiculture as far as you remember? .....

F: HUSBANDRY & POULTRY

F1. How many animals do you have now? And how many did you have **five (5) years ago**?

	F1-1. Currently	F1-2. Five (5) years ago
1		
2		
3		

F2. What are/were your main **husbandry and poultry products**? And, to whom do you sell these products?

	F2-1.Currently	F2-2.Five (5) years ago	F2-3. Purchaser (now)
1			
2			
3			

F3. How much of the **animal feed** do you produce and how much of it do you buy?

	F3-1. Feed	F3-2. Produced (%)	F3-3. Bought (%)
1			
2			
3			

F4. Do you take your **animals off to the pasture? How often? For how long? Distance and name** of it?

F5. Do you have **insurance of livestock?**

(1) Yes
(2) No → Why?.....

F6. When was the most productive year for husbandry & poultry as far as you remember? .....

G: WATER USE/DEPENDENCY

G1. How much are you dependent on water resources regarding….?

None (1), not much (2), average (3), more than average (4), very much (5)

	G1-1.Currently	G1-2.Five (5) years ago
Agriculture		
Apiculture		
Breeding and poultry		
Daily usage		
Other		

H. LAND USE

H1. How much land do you use? How much of it is **yours/rented/used free of charge**?

H1-1.Total (decare)	H1-2.Registered to household	H1-3.Rented	H1-4.Free of charge

H2. How much land do you use without **certificate of inheritance**? ……. ……..

H3-1. Did you **sell/buy** land anytime soon? If yes, how much?

…… is sold out ……. is bought

H3-2. If any of these **above** are answered as **YES, ask WHY**?

H4-1. Are you planning to **sell/buy** land in near future?

…… to be sold out ……. to be bought

H4-2. If any of these **above** are answered as **YES, ask WHY**?

H5. How much of the land that you used is **irrigated**? …….

I: HEALTH & INSURANCE

I1. Do all members of your household have **health insurance**?

(1) Yes
(2) No → How many of you do not have health insurance?
…….

I2. How often do you feel in need of **seeing a doctor**? How was it five (5) years ago?

I2-1.Currently	Never	Not very often	Average	Often	Very often

I2-2.Five (5) years ago	Never	Not very often	Average	Often	Very often

Declarations

I declare that I have completed the thesis independently using only the aids and tools specified. I have not applied for a doctor's degree in the doctoral subject elsewhere and do not hold a corresponding
doctor's degree. I have taken due note of the Faculty of Mathematics and Natural Sciences PhD Regulations, published in the Official Gazette of Humboldt-Universität zu Berlin no. 42/2018 on 11/07/2018.

Berlin, 20/01/2020
Özge Can Dogmus

I declare that the written and electronic versions of my doctor's thesis submitted to the University Library match the accepted thesis.

Berlin, 16/06/2020
Özge Can Dogmus